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ABSTRACT

A study examined tech prep (TP) implementation in the United States. Questionnaires were mailed to a geographically representative sample of 473 of the 855 local TP coordinators identified. Completed questionnaires were returned by 84% of the coordinators surveyed. The study established that as many as 50% of the nation's high schools are participating in a local TP consortium. Coordinators rated student outcomes in 15 of 17 categories as "high" or "very high." Educators, parents, students, and employers were found to be highly supportive of TP, and nearly all consortia had conducted professional development activities for secondary/postsecondary personnel. Lingering challenges facing TP included the following: resource constraints, TP's broad and conflicting goals, and low degrees of implementation of the work-based learning and apprenticeship components of TP programs. Recommendations included calls for increased funding of TP and expansion of the scope/focus of TP beyond the 2+2 concept to include change agents at the elementary, middle school, college, and university levels. (Fifteen tables and 54 references are included. Appended are a table summarizing the survey population, sample, and response rate by state and aggregated responses to the local TP implementation survey.) (MN)

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TECH PREP IMPLEMENTATION IN THE UNITED STATES: PROMISING TRENDS AND LINGERING CHALLENGES

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TECH PREP IMPLEMENTATION IN THE UNITED STATES: PROMISING TRENDS AND LINGERING CHALLENGES

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EXECUTIVE SUMMARY

The Carl D. Perkins Applied Technology and Vocational Education Act of 1990, commonly known as Perkins II, included Tech Prep within the special projects section (Title IIIE). Federal funds were appropriated for this initiative beginning in July of 1991. Since that time, each of the fifty states and the District of Columbia has been involved in Tech Prep education activities; all have contributed to the research findings reported in this document. In the summer of 1993, a questionnaire was mailed to 473 of the identified 855 local Tech Prep coordinators in the United States with 84% of those asked to participate returning a completed questionnaire. The research focused on these five research questions: (1) What are the characteristics of local Tech Prep consortia and their coordinators? (2) What are the goals, elements, and outcomes of local Tech Prep initiatives? (3) At what stage of implementation are local Tech Prep initiatives and selected Tech Prep components operating within those initiatives? (4) What barriers are perceived to impact local Tech Prep implementation? and (5) What do local coordinators perceive to be needed changes in state and federal policy?

Promising Trends and Lingering Challenges

Findings obtained for the five research questions were helpful in capturing a comprehensive description of how local Tech Prep implementation has proceeded in the United States through the first two years of federal support. Among this wealth of information, the survey responses revealed the following promising trends:

- As many as 50% of the nation's high schools are identified by respondents as participants in Tech Prep implementation in a local consortium, indicating dramatic growth in Tech Prep activity at the secondary education level from 1991 (pre-Perkins II) to 1993 (post-Perkins II).

- Although it is nearly impossible to identify any organizational configuration of a local Tech Prep consortium as typical, these findings indicate that on average the majority of local consortia consist of twelve high schools, two postsecondary schools, and ten private-sector business and industry firms. The organizational structure of the consortium, including secondary schools, postsecondary schools,

business and industry, and sometimes other organizations, may enhance Tech Prep implementation efforts.

- Coordinator ratings of student outcomes showed a high level of consensus. Fifteen of the seventeen student outcomes were given a "high" or "very high" mean rating. These fifteen highly rated outcomes presented a broad array of expectations for Tech Prep participants and graduates, incorporating the areas of academic skill attainment, employability skill attainment, and matriculation from high school to college.

- Several stakeholder groups showed a high level of support for Tech Prep. The level of support for seven different groups was rated, on average, to be "good" to "excellent." These groups were state agency personnel, vocational faculty, local two-year postsecondary administrators, business/industry representatives, local secondary administrators, students, and secondary school board members. Only one group was given an average rating of "fair." This group was four-year college/university personnel.

- Professional development of secondary and postsecondary personnel has been carried out by nearly all local consortia. Nearly 90% reported joint inservice training for teachers from an entire consortium to be a formally stated focus on their Tech Prep initiative. Professional development of secondary personnel regarding Tech Prep was more prevalent than of postsecondary personnel. Although, on average, one-half of vocational faculty, counselors, and administrators at both levels were reported to have participated in Tech Prep inservice in local consortia.

The data from this research also revealed the following lingering challenges:

- Most of the Tech Prep coordinators worked on Tech Prep part-time or as part of their regular job. Other resource constraints were evident in the findings, including the widespread perception of a lack of joint planning time and a lack of staff, time, and money as barriers to local implementation.

- The Tech Prep initiative has broad and conflicting goals and, as such, Tech Prep access may not be available to *all* students, even though equal access for all students was reported as a priority for most consortia. The findings show the vast majority of local consortia directing curriculum goals to serve the middle two quartiles of

students in academic ability, bringing into question the role Tech Prep can and should play in educational restructuring endeavors.

- Little postsecondary curriculum reform and development for Tech Prep was reported except for formal articulation of vocational and academic courses. Over one-half of the respondents also reported implementing occupational/career clusters at the secondary and postsecondary levels. In addition, the findings associated with curriculum reform show that at the secondary or postsecondary levels few local consortia were engaged in what might be considered more advanced and complex curriculum reform such as providing advanced-skills courses, career academies, or interdisciplinary courses.

- School-to-work components such as work-based learning and apprenticeship have not been widely implemented. However, work-based learning was identified as a formally stated focus of two-thirds of the local consortia participating in the study and the level of implementation of work-based learning was perceived to be higher for consortia funded in 1991 than in 1992.

- The most serious barriers to the implementation of Tech Prep are deeply rooted and have not been surmounted. The obstacles of not enough time designated for joint planning by vocational and academic or secondary and postsecondary faculty; the failure of four-year colleges and universities to award college credit for applied academic or other Tech Prep courses; a lack of general awareness about Tech Prep; and the lack of staff, time, and money were perceived by respondents as having the most impact on their activities, and their impact has remained serious with the passage of time.

Recommendations

The data collected and analyzed from this national study of local Tech Prep implementation support the following recommendations:

- Due to the growing involvement in Tech Prep activities across the nation and the reality that change within public schools requires time, funding for the Tech Prep initiative should be continued at the federal level and expanded to include local and state funds. Financial support must be continued to bolster the existing efforts to

induce systemic change within the nation's public school and two-year college system.

- The scope and focus for students involved with Tech Prep should be expanded beyond the 2+2 concept to include the participation of change agents at other educational levels, especially elementary and middle schools, and colleges and universities.

- With global economic competition a reality and with the development of human resources recognized as a key factor in the economic development of the nation, Tech Prep should be promoted and marketed on a national level as a viable avenue for U.S. citizens to attain lifelong learning and global workforce skills; the need for marketing of Tech Prep concepts is also critical at the local and state levels where workforce development and economic needs are most acute.

- Accountability, high standards, and evaluation of Tech Prep programs are all imperative to ensure that the goals of this federally supported initiative are being met. This research has revealed that only a small percentage of Tech Prep consortia are actively addressing the issues of evaluation and accountability. Therefore, the funding agencies for Tech Prep should develop viable on-site accountability and evaluation mechanisms that can ensure that high standards and expectations are being identified and met.

- The nation's public schools are caught in a quagmire of different national reform initiatives such as Goals 2000, School-to-Work Opportunities (STWO), and Tech Prep, with many more reform initiatives dictated to public schools at the local and state level. This uncoordinated educational reform effort creates confusion and fragmentation of activities within schools as evidenced by the "fad" perception that many of these efforts hold among teachers, parents, and school administrators. A concerted effort at all administrative levels is needed to link reform initiatives together that can build on existing efforts, improve upon the reform processes, and move forward with school reform initiatives.

- The barriers to implementation of Tech Prep should receive special notice. Research should be developed to search for and discover why barriers exist in various educational environments, especially among teachers and educational

institutions, which are perceived to be the "great equalizer and designed to empower our nation's people" and not the contrary as this research indicates.

In conclusion, with local consortia having made commitments to the Tech Prep concept, promising trends are emerging with evidence of enthusiasm reported among educators, parents, students, and employers. These groups appear to be utilizing the Tech Prep concept to improve existing educational systems, expanding students' opportunities to be productive in the workplace and successful in life's pursuits. A continuing challenge for our nation is to support the many local Tech Prep consortia that show commitment to Tech Prep in ways that can ensure reform will be significant and lasting.

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INTRODUCTION

Tech Prep represents a relatively new investment of federal resources in the American educational system. The concept has spread rapidly since federal support became available in July of 1991. In the 1990-1991 school year, the year prior to the start of federal funding, only 18% of the nation's secondary schools and 11% of vocational-technical education programs had Tech Prep programs (U.S. General Accounting Office, 1993). In the 1991-1992 school year, 41% of regular school districts and 82% of vocational districts reported initiating Tech Prep programs (Office of Educational Research and Improvement, 1994). By the fall of 1992, over 850 local consortia with multiple secondary and postsecondary schools and school districts were taking part in federally funded activities (Layton & Bragg, 1992). Recently, Tech Prep has been identified as one of several promising programs in the Clinton Administration's School-to-Work-Opportunities (STWO) initiative. This new federal legislation has a primary goal of creating a national school-to-work transition system built on stronger linkages between education and the workplace.

Tech Prep as a public education policy has reached a point where additional information needs to be collected and disseminated in order to (1) better understand how local practitioners conceptualize Tech Prep policies and programs; (2) determine how specific components, elements, and processes associated with Tech Prep are perceived to be progressing; (3) identify potential barriers to local implementation; and (4) understand the strengths and weaknesses of various aspects of Tech Prep policies and programs. This information is essential to understanding the extent to which local implementation efforts are consistent with the intent of the federal Tech Prep Education Act. Information from a national study of local implementation can also assist local, state, and federal policymakers in developing Tech Prep programs that can evolve in ways that benefit students, high schools, community colleges, employers, and other concerned groups.

Purpose of the Study

To address these goals, this study used a survey designed to examine local Tech Prep implementation in the United States. The research considered the goals, policies, practices, and obstacles encountered in conducting local implementation activities. Data

obtained from this study depicts the knowledge, attitudes, and beliefs of individuals at the forefront of the nation's Tech Prep charge—local Tech Prep consortium coordinators. The primary purpose of this study was to describe how Tech Prep policy has been implemented by local consortia, including examining the ways in which varying contexts (e.g., settings, funding) of the local consortia have interacted with Tech Prep development. The following were the five major research questions for the study:

1. What are the characteristics of Tech Prep local consortia and their coordinators?

2. What are the goals, elements, and outcomes of local Tech Prep initiatives?

3. At what stage of implementation are local Tech Prep initiatives and the selected components operating within these initiatives?

4. What barriers are perceived to impact local Tech Prep implementation?

5. What do local coordinators perceive to be the needed changes in state and federal policy?

This study was intended to go beyond a general description of implementation to create a better understanding of how and why Tech Prep has evolved as it has at the local level. The rhetoric surrounding Tech Prep has included claims of its benefits as well as its impediments. Yet, in all of the discourse surrounding Tech Prep, little empirical evidence has been presented to support either side's assertions. Answers to many important questions remain unanswered: What is the fundamental purpose of Tech Prep? What goals and outcomes are (or should be) associated with it? Is Tech Prep primarily a reform of vocational education or is it a total educational reform? Does Tech Prep apply to the "neglected majority" only or is it appropriate for all students? Can Tech Prep be a viable approach to school-to-work transition? These are critical questions that must be raised and addressed. Answers are essential to moving beyond the rhetoric and establishing a knowledge base. By offering a comprehensive picture of Tech Prep implementation, we contend that local consortia will be better able to develop viable programs, and state agencies will be more capable of providing the support and resources needed for these local consortia to grow and flourish. Finally, a better understanding of Tech Prep can help assess its potential within the context of current local, state, and federal educational reform agendas. With that information, all levels of education will be positioned better to consider the role Tech Prep *should* play in future educational reform policy and programming.

This document presents a brief synthesis of the literature on Tech Prep focusing on the Tech Prep Education Act and implementation of that federal legislation at the local and state levels. The report also presents descriptive findings associated with the study's five research questions. Although the data lends itself to the use of inferential statistics, the primary purpose of this report was to provide a baseline of descriptive information concerning Tech Prep implementation by local consortia. Our goal was to present descriptive findings in a concise manner for an audience composed largely of local and state education practitioners. This document presents descriptive findings associated with (1) characteristics of Tech Prep consortia and coordinators; (2) goals, elements, outcomes, and curriculum reform; (3) stage of implementation of Tech Prep; (4) barriers to local implementation; and (5) local coordinator recommendations for state and federal policy. The report concludes with a summary of major findings, conclusions, and recommendations.

The Federal Role and the Tech Prep Education Act

Tech Prep has evolved over the past two decades from efforts to reform vocational education through increased secondary-to-postsecondary articulation (Dornsife, 1992; Hull & Parnell, 1991). Additionally, beginning in the early 1980s, practitioners were encouraged to give more attention to the integration of vocational and academic curriculum (National Commission on Secondary Vocational Education, 1984). Even though these ideas were discussed widely, few localities have implemented full-scale Tech Prep programs (McKinney, Fields, Kurth, & Kelly, 1988; Nothdurft & Jobs for the Future, 1990). It was not until the 1990s and the passage of federal legislation that Tech Prep saw the opportunity for adoption on a nationwide scale.

On July 1, 1991, the Carl D. Perkins Vocational and Applied Technology Education Act of 1990, commonly known as Perkins II, came into effect. This legislation continued the federal government's commitment to supporting vocational education since passage of the Smith-Hughes Act in 1917. The intent of this newest vocational education legislation was closely tied to a need for the United States to enhance its position in the global economy through developing a more competitive workforce. Economic development and workforce preparation were identified as the primary impetus for continued federal funding of vocational education. The Perkins II legislation declared its

purpose to "make the United States more competitive in the world economy by developing more fully the academic and occupational skills of all segments of the population" (U.S. Congress, 1990). This overarching purpose was to be achieved through an array of occupationally oriented programs including programs and services for special populations, accountability through the use of measures and standards, integration of vocational and academic education, and Technical Preparation (Tech Prep).

A closer examination of the legislation reveals that although the nation's economic challenges were prominent in the rationale for continued federal funding of vocational education with Perkins II, other societal and educational needs were identified as well. The legislation recognized that traditional approaches to schooling have been inadequate to prepare many of the nation's youth for either further education or work beyond high school, especially special population groups and students not traditionally bound for college. Cited in the legislation were dropout rates of 50% or higher for high school students in urban schools and for Hispanic youth. Given these circumstances, the legislation acknowledged that reaching the goal of global economic competitiveness would be futile without first attacking the many serious problems that exist within the nation's educational system. Tech Prep is positioned within the Perkins II legislation as an educational policy targeted at this complex set of educational and economic issues.

The Tech Prep Education Act came into effect in July of 1991 under Title IIIE of Perkins II. According to this federal legislation, Tech Prep means a combined secondary and postsecondary education program which—

(A) leads to an associate degree or 2-year certificate;

(B) provides technical preparation in at least 1 field of engineering technology, applied science, mechanical, industrial, or practical art or trade, or agriculture, health, or business;

(C) builds student competence in mathematics, science, and communication (including applied academics) through a sequential course of study; and

(D) leads to placement in employment. (U.S. Congress, 1990)

Under the Tech Prep Education Act, states are to use federal funds to establish local Tech Prep consortia comprised of local education agencies and public or private higher education institutions.[1] (A three-year development and implementation plan was specified.) According to the federal legislation, local consortia are to develop and operate four-year (2+2) Tech Prep initiatives. When funding programs, the legislation also suggested special consideration be given to consortia that (1) provide effective placement in employment or transfer of students to four-year baccalaureate-degree programs; (2) are developed in consultation with business, industry, and labor; and (3) address dropout prevention and re-entry and the needs of special population groups.

The law placed the responsibility for planning, development, and implementation of new Tech Prep initiatives in the hands of local consortia. The legislation was general; however, it did specify "essential elements" that provide an indication of what constitutes a fully implemented Tech Prep program. By law, consortia funded with federal dollars are charged with addressing these seven essential elements:

1. Formal, signed articulation agreements between consortium participants.

2. A core of required courses in mathematics, science, communications (including applied academics), and technologies in the two years of secondary school preceding graduation and two years of higher education or an apprenticeship of at least two years following secondary instruction.

3. Curriculum development appropriate to the needs of consortium participants.

4. Inservice training for teachers representing all consortium participants in how to implement Tech Prep curricula effectively.

5. Training for counselors in how to recruit students to Tech Prep and ensure that students complete such programs and move into appropriate employment.

6. Equal access for special populations to the full range of Tech Prep programs, including the development of services appropriate to the needs of such individuals.

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[1] In addition to funds appropriated for Tech Prep by Title IIIE of Perkins II, states can elect to use funds from Title II of the Perkins II bill which authorizes support for local vocational education programs, especially directed to meet the needs of special populations.

7. Preparatory services to help all populations to participate in Tech Prep.

Together, these generally stated elements are intended to provide a focus for implementation of local Tech Prep programs.

Local Implementation of the Federal Tech Prep Legislation

In this educational policy study, a classical definition of policy implementation was employed. Implementation was viewed as the process of carrying out public policy to produce an educational program which, in turn, results in intended and unintended outcomes: "Implementation may be viewed as a process of interaction between the setting of goals and actions geared to achieving them" (Pressman & Wildavsky, 1971, p. xv). Our view of implementation was also influenced by the contemporary perspective taken by Odden (1991) described as "the third stage of education policy implementation" (p. 8). He suggested that in order to obtain a deep level of understanding of how policy is put into place at the local level, it is necessary to focus on "local, micro-implementation issues, and the connections between micro- and macro-implementation concerns" (p. 8). When taking this approach, it is particularly important to ascertain the perspectives of those actively involved in carrying out local implementation actions. In the case of Tech Prep, local Tech Prep coordinators were deemed most knowledgeable of the activity associated with local Tech Prep implementation.

Given this perspective toward policy implementation, our study was particularly attentive to local implementation actions taken in relationship to federal Tech Prep policy. The Tech Prep Education Act has provided a federal directive and, to some extent, a general conceptual framework for local and state implementation. The extent to which that federal directive and framework have been understood and put into place at the local level was of particular interest. Of course, at this early stage, relatively little is known about local Tech Prep implementation. Survey research and field studies have only begun to provide a general description of the goals, scope, and character of local Tech Prep programs under the federal law. Studies by Bragg (1992); Layton and Bragg (1992); Dornsife (1992); Hoerner, Clowes, Lachowica, Wehrley, and Hammons (1992); and the Office of Educational Research and Improvement (OERI) (1994) represent relatively preliminary efforts to understand local Tech Prep implementation. However, taken together, these studies provide the most comprehensive knowledge base available on Tech Prep. Based on

these studies, this section of the report summarizes the existing literature in the areas of funding and administrative policies and practices, models and components of Tech Prep programs, and perceived barriers to local implementation.

Funding and Administration of Tech Prep

Without doubt, the Tech Prep Education Act has been influential in stimulating various implementation activities related to Tech Prep across the nation. The interim report of the National Assessment of Vocational Education (NAVE) concluded that "school districts developing tech prep, those receiving Title III funds, are more likely to have taken specific implementing steps than those without funds" (OERI, 1994, p. 355). The study also indicated that "the Perkins Act has had a role in increasing the overall level of tech-prep activity" (p. 360) by playing an indirect role in the start up of Tech Prep in districts not receiving federal funds. In addition to the findings of the NAVE study, other research confirms the contribution of the federal legislation to the growth of local Tech Prep programs.

Prior to passage of the federal legislation, fewer than 150 local Tech Prep programs could be identified (McKinney et al., 1988; Stern in Nothdurft & Jobs for the Future, 1990). In the initial year of federal funding in Fiscal Year (FY) 1992, all 50 states and the District of Columbia made grant awards with approximately $66 million in federal Tech Prep funds (Layton & Bragg, 1992). A total of 724 grants were awarded with federal funds, of which 82% of the grants were designated by the states for planning; 12% for implementation; and 6% for demonstration, exemplary, or continuing projects. Most states classified first-year grants as "planning"; most identified grants funded for a second year or beyond as "implementation." Typically, "demonstration," "exemplary," or "continuing" grants were reserved for local consortia that had operated Tech Prep prior to passage of the Tech Prep Education Act, although there were some exceptions such as the six consortia established in California to develop curriculum for various vocational areas (e.g., agriculture, health, or engineering technologies).

With a nearly 50% increase in federal funding between FY92 and FY93, the total number of grants awarded in FY93 increased to 855. In FY93, 42% of FY93 grants were for planning and 56% were for implementation. Only 15 of the 855 grants awarded by all 50 states were classified as demonstration or exemplary. Apparently, during this second year of implementation of Tech Prep, the states were more likely to classify grants as

implementation than to use the demonstration or exemplary classification. Also, in this second year of implementation of the Tech Prep Education Act, federal funding continued to be the predominant mode of fiscal support for local Tech Prep endeavors. Only 21% of the states reported contributing funds to Tech Prep and in nearly all these cases the state investments were quite small compared to the federal government's contribution. The state of Illinois was a notable exception where $3 million in state funds were appropriated annually for Tech Prep in addition to the state's allocation of approximately $4 million in federal funds.

Funding levels varied among the 50 states and even within states from FY92 to FY93. In FY92, planning grants averaged $56,000, continuing planning grants in FY93 averaged $70,000, and new planning grants averaged $66,000. Funding for continuing implementation grants showed a different pattern, largely because of the dramatic increase in the number of these grants in FY93. These grants dropped from an average of $124,000 in FY92 to an average of $99,000 in FY93. New implementation grants in FY93 were funded at an even lower average level of $74,000—a level roughly equivalent to new planning grants. This decline in funding was probably related to attempts by the states to spread federal funds more broadly to local areas. There was no evidence to suggest state agencies reduced funding in FY93 because Tech Prep implementation actually required fewer dollars. In fact, when asked about barriers to local implementation, several of the state agency staff reported a lack of staff, time, and money (Layton & Bragg, 1992).

Nearly all the states described the federal Tech Prep Education Act as the primary driving force behind their own Tech Prep policies, definitions, and goals (Layton & Bragg, 1992). In the first year of implementation of Tech Prep in 1991, the majority of Tech Prep coordinators (a position and title not required by the federal legislation but widely adopted by the 50 states) reported that their agencies had virtually restated federal definitions and "essential elements" in their own documents, usually without adding further depth or perspective. In most states, the federal legislation, as it appeared in the Tech Prep Education Act, provided the general framework for the program elements specified in requests for proposals (RFPs) disseminated to local agencies. Then, when proposals were funded, local agencies were charged with carrying out the generally agreed upon activities. Evaluation of these grants was at the discretion of local and state agencies since no program evaluation requirements were specified in the federal Tech Prep Education Act.

In their second year of federal support, policies of the states regarding Tech Prep continued to echo federal law. However, some states reported expanding Tech Prep requirements beyond what was communicated during the previous year. Although wide ranging, responses of the 50 state Tech Prep coordinators to a question about their states' policies and goals for Tech Prep clustered in six areas (Bragg & Layton, in press). First, some state coordinators described their state's primary goal for Tech Prep as a way to better meet the needs of students who had typically not chosen the college-prep track. This goal was representative of the focus of Parnell's (1985) "neglected majority" argument and consistent with the federal law's emphasis on creating Tech Prep for untrained, unprepared, or dropout-prone youth.

Second, some state coordinators described their state's goal for Tech Prep as a means to provide an alternative curriculum pathway or track, especially in high school. Indicative of this goal was an observation made by several state coordinators that Tech Prep could "eliminate the general track." This goal was similar to Parnell's (1985) emphasis on replacing general education with what he perceived to be the more focused Tech Prep option.

A third goal for Tech Prep, as described by some of the state coordinators, was to create alternative teaching and learning strategies to make education more meaningful, particularly to high school students. This goal was to be accomplished by using applied academics, the integration of vocational and academic education, upgraded vocational or technical curriculum, and/or cooperative teaching and learning strategies. Here, the fit of this goal with the federal legislation was less apparent. Although the federal Act emphasized a core curriculum for Tech Prep, it specifically mentioned "applied academics" rather than "academic and vocational integration," the terminology used throughout the remainder of the federal vocational education bill.

The need for a better linkage between school and work or college was described by a few state coordinators as a fourth goal for Tech Prep. This goal was associated with a need to create more systematic mechanisms to assist youth in their transition from school to work. Though mentioned only briefly as a purpose for the Tech Prep Education Act, school-to-work transition has been a primary focus of the Clinton administration's

School-to-Work Opportunities (STWO) initiative.[2] Several of the state Tech Prep coordinators indicated that their states were considering how this new federal directive could influence Tech Prep, and how Tech Prep could serve as a vehicle for STWO.

A fifth goal specified for Tech Prep by some of the state coordinators was to eliminate inefficiencies between secondary and postsecondary education, including controlling or reducing the escalating incidence of remediation of new two-year college students. Indicative of the impact that Tech Prep could have at the postsecondary level, this particular purpose for initiating Tech Prep was only evident in the definition provided for "articulation agreement" in the federal law. In a brief definition provided in the legislation, articulation was described as a way "to provide students with a non duplicative sequence of progressive achievement" (U.S. Congress, 1990).

As described by many of the state coordinators, a final goal of Tech Prep was to prepare individuals for future workforce needs and strengthen the U.S. economy. Consistent with the primary goal of the federal Perkins II legislation, Tech Prep was seen as a vehicle for extending vocational education, workforce preparation, and economic development. Positioning Tech Prep within the federal vocational education legislation seemed to send the signal that Tech Prep was to be a vocational education program. In that way, Tech Prep appeared to be consistent with the federal government's historical role of supporting local and state vocational education programs.

The policies and goals established by the states for Tech Prep were diverse, ranging from objectives linked to school reform to economic development. Sometimes within a single state a number of different and potentially competing goals were seen as important, helping to explain why various models and program components have been associated with the Tech Prep concept.

Tech Prep Models

Since the mid-1980s, a predominant model associated with Tech Prep has been the Tech Prep Associate Degree (TPAD) model introduced by Parnell (1985) in *The Neglected*

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[2] The School-to-Work Opportunities Act of 1993 was introduced by the Clinton Administration to the U.S. Congress in September of 1993. On May 4, 1994, President Clinton signed this federal legislation into law. Any educational initiative funded under this new legislation will be required to have a school-based component, work-based component, and activities that connect school-based and work-based learning.

Majority. Elements of this model were apparent in several aspects of the federal Tech Prep Education Act, specifically in the requirements for core technical and academic curriculum and 2+2 articulation agreements leading to an associate degree. Through the apparent legislative endorsement of TPAD, this model has implementation activity. However, other Tech Prep models have begun to appear in practice. This section of the literature review describes the characteristics of these various Tech Prep models to provide a more concrete description of what local practitioners have attempted to accomplish when implementing Tech Prep programs.

The Tech Prep Associate Degree (TPAD) Model

In 1985, Parnell provided a vision and conceptual framework for Tech Prep. He envisioned it to provide high quality vocational education, applied academics, strong relationships between business and education, and increased emphasis on the two-year associate degree. He argued forcefully to refocus schooling to better meet the needs of the "neglected majority" of high school students who would never obtain a baccalaureate degree. By "neglected majority," Parnell was referring to "the ordinary students, the middle fifty percent of the high-school student population" (p. 139) which he saw as ill-served by the general education track. TPAD was designed to meet the needs of these "neglected" students:

> The four-year 2+2 tech-prep/associate-degree program is intended to run parallel with and not replace the current college-prep/baccalaureate-degree program. It will combine a common core of learning and technical education and will rest upon a foundation of basic proficiency development in math, science, communications, and technology—all in an applied setting, but with the tests of excellence applied to these programs as well as others. (p. 144)

General specifications for a TPAD curriculum at the secondary and postsecondary levels were made by Parnell in 1985 (and reinforced again by Hull and Parnell in 1991.) The secondary portion of the curriculum was considered preparatory to avoid problems encountered by traditional vocational education programs that were criticized for being too narrowly focused on job-specific training. Secondary programs were to include applied math and science, literacy, and possibly technical courses connected to career clusters and technical-systems study. The postsecondary curriculum was seen as the place for intense and specific technical specialization in such wide-ranging careers as nursing, electronics, computers, business, and agriculture. A specialization was to be developed along with a

broader foundation of technical and educational competence "aimed at working in a wide-technology society" (Parnell, p. 144). Ultimately, according to Parnell, this combined secondary-to-postsecondary education was intended to culminate with a two-year associate degree, "the preferred degree for employers seeking to fill a broad range of mid-level occupations" (p. 145).

Other Tech Prep Models

Five additional Tech Prep models have been described by Bragg (in press) as variations on TPAD that attempt to broaden the target population beyond the middle 50% of high school students to better address the needs of all students. Although these models have been implemented sparingly and are yet to be tested, they may eventually impact secondary and postsecondary education curriculum, and ultimately student outcomes. Additional research is needed to understand these relationships. Each of the models is introduced in this section of the document to help explain ways local Tech Prep consortia have implemented Tech Prep when the TPAD model was not the focus of local implementation actions.

The first model, the integrated Tech Prep model, has specified vocational and academic integration as a core curriculum for all students. Career academies and cluster schools have been described by Stern, Raby, and Dayton (1992) and Grubb, Davis, Lum, Plihal, and Morgaine (1991), respectively, as viable options for developing integrated vocational and academic curriculum accessible to all students. Where Tech Prep curriculum reform utilizing vocational and academic integration has begun, total school restructuring around various occupational foci have also been viewed as a potential outcome. This integrated Tech Prep (ITP) model has been adopted by a number of the 30 large urban school districts participating in a network project with the National Center for Research in Vocational Education (NCRVE) (Benson, 1993).

A second model has emphasized school-to-work transition consistent with the Clinton administration's STWO initiative. This work-based Tech Prep model has similar features to other Tech Prep models except that it has provided for greater emphasis on student participation in deliberately structured work-based learning experiences at the secondary and postsecondary levels. Examples of work-based learning strategies that have been utilized are cooperative education and youth apprenticeships (Bailey & Merritt, 1993). In the work-based learning Tech Prep model, work-based learning has reinforced

school-based learning and also supplemented connecting activities such as career counseling, guidance services, and job placement.

A third model has extended the focus of Tech Prep from the associate degree to the baccalaureate degree. This Tech Prep Baccalaureate Degree (TPBD) model has acknowledged the associate degree as an option for students; however, the TPBD model has also recognized that, at least for traditionally college-bound students (those in the top quartile of class rank), the Tech Prep path would not have been taken seriously as an option without an exit point at the baccalaureate-degree level. The TPBD model has emphasized the importance of extending formal articulation and curriculum integration starting at the high school and two-year college level into a baccalaureate-degree program (Cabrale & Johnson, 1993).

The adult Tech Prep model, a fourth model, has provided a pathway for adults who have not matriculated directly from high schools into two-year colleges to participate in Tech Prep at the postsecondary level (Schaad, 1993). These may be adults who were preparing to re-enter the workforce or those who were actively working but wished to upgrade skills or seek retraining opportunities. The adult Tech Prep model, a variation of which has been called a bridge program (Hull, 1993), has emphasized occupational and academic preparation, sometimes including work-based learning, and helped adult students transition into the college-level courses needed for an associate degree or beyond.

The fifth model is Pre-Tech Prep. This model has shown that the Tech Prep concept can be extended below the federally mandated starting point of the eleventh grade level. Pre-Tech Prep has connected elementary, middle, and junior high schools to 2+2 Tech Prep programs. These programs have emphasized career awareness and exploration, integrated curriculum, interdisciplinary projects, and team-centered cooperative learning in the early grades (R. Poovey, personal communication, February 26, 1992).

Components of Tech Prep Models

The TPAD and other emerging Tech Prep models configure various program components (defined in this study as concepts, actions, processes, or procedures associated with Tech Prep initiatives) to attempt to address particular student needs and reach specified outcomes. Since the time TPAD programs first began to be implemented in the 1980s, educators have considered ways to arrange various components to create

effective Tech Prep initiatives. This section of the report summarizes the literature associated with the following seven components frequently described as a part of Tech Prep:

- visioning, planning, and goal setting (Bragg, 1991; Bragg, 1992; Crabbe, 1993; Key, 1991; McKinney et al., 1988)
- administration and governance (Bragg, 1991; Brustein, 1993; Hull & Parnell, 1991; Key, 1991; Kirby & Layton, 1992; Layton & Bragg, 1992)
- formal articulation (Dornsife, 1992; Hull & Parnell, 1991; Ramer, 1991)
- curriculum (Ascher & Flaxman, 1993; Dornsife, 1992; Edling, 1992; Grubb et al., 1991; Hoerner et al., 1992; Hull, 1993; Ramer, 1991; Stern et al., 1992)
- guidance and counseling (Brustein, 1993; Chew, 1993; Dornsife, 1992; Maddy-Bernstein, 1994)
- marketing and recruitment (Dornsife, 1992; Williamson, 1993)
- program evaluation (Dornsife, 1992; Hammons, 1992; Layton & Bragg, 1992; McKinney et al., 1988)

Visioning, planning, and goal setting are all processes recognized as important to creating a foundation for Tech Prep. In an early study of articulated vocational-technical education programs, McKinney et al. (1988) identified factors related to planning as crucial to local implementation. Chief among these factors were open communication, strong local leadership, commitment to articulation, and the establishment of modest and achievable goals. Key (1991) recommended the creation of a written plan addressing goal-setting, assessment, instruction, and evaluation. She further recommended broad-based stakeholder involvement on local planning teams, all supported by a state Tech Prep coordinator. Bragg (1992) pointed to the need for highly customized planning processes that reflect the unique character of local communities and institutions and their stakeholders. Each of these studies pointed to the importance of comprehensive, yet locally sensitive planning processes.

Administration and governance are mandated by the federal Tech Prep Education Act to be carried out by a local consortium comprised of secondary and postsecondary institutions. Most consortia have involved a community college and its surrounding comprehensive high schools (Layton & Bragg, 1992). Often the two-year college has acted as the fiscal agent for the federal grant; usually a local educator at the two-year college level has been appointed as the coordinator or director of consortium activities. In many local consortia, decisions about organization, administration, and governance have been carried out by a local coordinator, along with an executive committee. In some cases, steering committees and advisory councils have been used as well.

Within local consortia, people have been organized in a number of different ways to carry out implementation. In a study conducted in Illinois, three organizational arrangements were identified for local Tech Prep consortia (Bragg, 1991). First, the functional approach involved consortium-wide committees organized around such areas as curriculum, marketing, implementation, or evaluation, as was advocated by Hull and Parnell (1991). Second, a site-based approach was created with teams of administrators, faculty, and counselors representing each of the sites affiliated with a consortium. Each site-based team concentrated on matters of concern to its own school, and then represented its constituents in the decisions of the consortium. Finally, the third organizational arrangement emphasized a combination of the functional and site-based approaches at both the school and consortium levels. Although these organizational patterns appeared descriptive of local consortium arrangements, relatively little is known about how they have affected implementation.

Formal secondary-to-postsecondary articulation has been a cornerstone of Tech Prep since its inception. Formal articulation involves the sequencing and coordination of courses and/or programs across the secondary and postsecondary levels to ensure smooth transitions and reduce student failure and drop out. Practitioners in California who participated in a delphi study to reach consensus on a 2+2 curriculum design for Tech Prep believed that articulation agreements should provide students with college credit for high school courses that also count toward the college major (Ramer, 1991). In addition to this advanced placement approach to formal articulation, an advanced skills articulation model has also been advocated for Tech Prep (Hull, 1993; Hull & Parnell, 1991). Articulation agreements referred to as "advanced skills" have linked technical and academic content throughout the entire 2+2 sequence, thereby providing a means of upgrading the

secondary-to-postsecondary curriculum. This type of articulation has been seen as particularly helpful to increasing student abilities to meet requirements for program completion. According to Hull and Parnell (1991) and Dornsife (1992), when an advanced skills articulation approach has been employed fully, it has provided increased technical and academic expertise for program completers.

Curriculum is an obviously critical component of Tech Prep. Referring again to the delphi study conducted by Ramer (1991), experts agreed on the importance of 2+2 or time-shortened articulation and the need to focus on occupations that had high employment demands and advanced knowledge and skill requirements. They further agreed that the curriculum should focus on technical skills, written and oral communications, mathematics, interpersonal skills, science, and job-search skills, similar to some of the core curriculum specifications of the Tech Prep Education Act. Hoerner et al. (1992) found that since passage of the federal legislation, a preponderance of local practitioners have used off-the-shelf applied academics courses for Tech Prep. These applied courses in mathematics, science, and communications have emphasized hands-on learning in academic skills viewed as more meaningful to students than traditional, didactic teaching methods.

Although use of applied academics course material has grown, issues about the effectiveness of applied academics have also been raised. Concern has been voiced about the rigor and effectiveness of applied academics in comparison to traditional pedagogy (Grubb et al., 1991). In addition, some have argued these courses have thwarted teacher collaboration when not systematically integrated with other parts of the curriculum (Dornsife, 1992). Finally, the lack of recognition of these courses for academic credit by four-year colleges and universities have been seen as another barrier to their use (Andrew & Grubb, 1992; Dornsife, 1992). Consequently, in the place of applied academics some local practitioners have begun to turn to other curriculum approaches such as those described earlier in this section as emerging Tech Prep models. In addition, Hoerner, Clowes, Wehrley, and Wang (1993) recommended project-based curriculum that focused on interdisciplinary projects carried out by teams of students.

Guidance and counseling is another component frequently identified with Tech Prep. Dornsife (1992) described the importance of having a centralized guidance and counseling center easily accessible to students to provide a collection of up-to-date print and nonprint career information. The more advanced Tech Prep programs described by

Dornsife expanded guidance and counseling into activities that included students in grades 7 and 8 or even K-14, and included individualized career/educational plans, mentoring programs, career exploration activities, and support services such as follow-up and program evaluation. Chew (1993) described the importance of counselor involvement in curriculum, partnerships, and career awareness. In the area of curriculum, Chew recommended that counselors serve on curriculum committees, communicate courses and requirements to students, and support classroom teachers with career information. Regarding partnerships, counselors were viewed as change agents, mediators between vocational and academic faculty, business and industry interns, human resource developers, and participants in staff development. Finally, in the area of career awareness, Chew described counselors as primary implementers of "a comprehensive developmental guidance model for K-12 students emphasizing technical career opportunities within the career component" (p. 32).

Marketing and recruitment is another component of Tech Prep. The four methods of marketing used by consortia studied by Dornsife (1992) were (1) media, (2) visitations/demonstrations, (3) presentations, and (4) promotional events and activities. In the early stages, local consortia created brochures to help announce the program, provide definitions of central ideas associated with Tech Prep, and address key questions such as "What is Tech Prep?" "How should students enroll in it?" and "What are the benefits of it?" Later, after Tech Prep moved into the developmental stages, formal marketing campaigns were conducted to get information about Tech Prep to more audiences through more vehicles. Sometimes at this stage a formal committee was charged with overseeing marketing and promotions. Students and parents were the primary audience of these Tech Prep campaigns. This activity seemed especially important given Ramer's (1991) finding that communications to students and parents about Tech Prep were very difficult and a major barrier to successful implementation.

Program evaluation is yet another component described as important for Tech Prep. McKinney et al. (1988) reported a lack of attention paid to program evaluation for articulated vocational-technical education programs. Responses to a national mail survey about program evaluation conducted by McKinney et al. indicated that less than 20% of the secondary and postsecondary sites surveyed thought a common evaluation system was of high importance. In a study reported by Dornsife in 1992, program evaluation was recognized as a weak component of Tech Prep. This study indicated that routine use of

program evaluation occurred with only the most advanced Tech Prep sites and there the primary goal was to track student course enrollments and demonstrate accountability to governmental units. Outcomes assessed were course enrollments, program completions, and job placements—all relatively compliance-oriented measures.

By the fall of 1992, Layton and Bragg (1992) determined that only 40% of the states had identified outcomes for local Tech Prep programs and these were wide ranging. According to the state Tech Prep coordinators interviewed, outcomes considered important by these states were similar to those reported earlier by Dornsife (1992). The outcomes included improved technical and academic skills, secondary and postsecondary program completion rates, job placement rates, and course enrollments at the secondary and postsecondary levels. Added to this list, however, was vocational-technical and academic skills, a measure required by Perkins II to evaluate local vocational education programs. Research conducted by Hammons (1992) identified performance indicators for Tech Prep consistent with the state coordinator findings; however, he also identified outcomes related to student careers, attitudes/perceptions, and other areas. Taken together, this research suggested that although some knowledge has accrued to facilitate local implementation, more needs to be known about Tech Prep to overcome barriers and create successful initiatives.

Barriers to Tech Prep Implementation

Barriers to Tech Prep implementation have been discussed in the literature. These barriers have included insufficient resources, difficulties with getting time and authority for faculty to do curriculum reform work, problems with leader commitment, poor quality and inappropriate professional development, and inadequacies in program evaluation (Andrew & Grubb, 1992; Dornsife, 1992; Hammons, 1992; Hoerner et. al., 1992; Layton & Bragg, 1992; McKinney et al., 1988; Ramer, 1991). Five additional categories of barriers associated with the policies, goals, and components of Tech Prep have been reported in the literature. These were (1) ambiguous identity for Tech Prep, (2) difficulties with integrating vocational and academic education, (3) turf battles between secondary and postsecondary education, (4) problems meeting student needs, and (5) unclear and inconsistent benefits for two-year postsecondary education programs. Each of these barriers is discussed briefly here.

First, the continuing difficulty of Tech Prep to obtain a clear sense of identity, and consensus around that identity, has been recognized as a problem by practitioners, policymakers, and researchers alike (Layton & Bragg, 1992). Tech Prep has struggled to achieve a unique and compelling identity. Some have asked, is it another form of vocational education? Is it a vehicle for educational reform? Is it for all students or only the middle 50%? At this early point in implementation, few localities have fully developed the 2+2 core curriculum mandated by the Tech Prep Education Act (Clowes, Hoerner, Wang, & Wehrley, 1993). With so little to show at this stage, the perception that Tech Prep is simply another name for vocational education is an understandable one given its official positioning within the federal vocational education legislation. Nonetheless, if Tech Prep is intended to be something different, something more, then it requires a clearer definition and conceptualization to avoid what Fullan (1991) has described in the following as one of the most serious obstacles to successful implementation of local changes:

> [L]ack of clarity—diffuse goals and unspecified means of implementation—represents a major problem at the implementation stage; teachers and others find that the change is simply not very clear as to what it means in practice. Legislation and many other new policies and programs are sometimes deliberately stated at a general level in order to avoid conflict and promote acceptance and adoption. . . . [However] unclear and unspecified change can cause great anxiety and frustration to those sincerely trying to implement them. (pp. 70-71)

Second, there have been difficulties in bridging the vocational and academic education gap at both the secondary and postsecondary levels. Vocational and academic faculty have objected to teaching across subject matter lines without adequate preparation (Hoerner et al., 1992). Also, faculty have lacked the knowledge and experience with work outside of school that has been necessary to weave workforce preparation concepts into teaching. Further, some faculty have lacked the skills and knowledge needed to undertake the extensive design and development work required to restructure curriculum. Even when faculty have had sufficient background and interest in curriculum development, too often they have not been given the time or authority to do the work properly (Andrew & Grubb, 1992). When confronted with these issues, many faculty have taken a logical step—they have retreated to the more familiar territory of "vocational" or "academic" teacher. They have continued to perpetuate, often unintentionally, educational tracks that have inequitably distributed opportunity for upward mobility to high school students.

Third, turf battles have occurred between secondary and postsecondary education since formal articulation efforts began. Problems over control of curriculum and distribution of resources have stimulated this controversy (Dornsife, 1992). Educators on both sides of the disputes have feared that formal linkages between high schools and two-year colleges have forced them to give up practices they hold dear. Sometimes full-time college faculty have resisted having what they have perceived to be the secondary pedagogy of Tech Prep thrust upon them. Often, part-time faculty—the majority of faculty in most community colleges—have been uninformed and uninvolved in Tech Prep in any meaningful way. Many community colleges do not appear to have connected Tech Prep with other high-priority activities such as transfer education, remedial programs, and contract training. All of these local matters have been complicated further by state-level secondary and postsecondary agencies that have not worked together to facilitate local articulation and Tech Prep.

Fourth, relatively few high school students have known much about two-year college education or given it serious consideration when making post-high school plans. Given the infancy of Tech Prep, relatively few students have known about it as a path to two-year college or possibly further postsecondary education. Sometimes, even when high school students and their parents have known about Tech Prep, their skepticism about its benefits has been an issue related to this barrier (Ramer, 1991). Further, many students at the postsecondary level have held full-time jobs and participated in two-year college in erratic ways (Adelman, 1992). These enrollment patterns have contributed to the difficulties two-year colleges have experienced in creating a sequenced core curriculum for Tech Prep. Certainly the concept of a core curriculum has been more straightforward in comprehensive high schools where students are a more captive audience.

Finally, when high school students have chosen to participate in two-year occupationally oriented studies, research conducted by Grubb (1990) on economic outcomes has suggested that "only complete vocational programs, and presumably programs that contain adequate amounts of related academic course work provide individuals access to careers with higher earnings" (p. 246). Transfer to four-year programs has occurred only on a limited basis. Prager (1993) challenged the notion that transfer from two- to four-year education would be accomplished easily, even in states where two-year colleges have been a part of four-year institutions and state transfer policies have been designed to support the idea.

Each of the barriers reported in the literature has been purported to have an impact on local implementation of Tech Prep. However, similar to all other aspects of local implementation, little research exists to help understand these phenomenon. The remainder of this report focuses on the methods, findings, conclusions, and recommendations obtained from our study of local Tech Prep implementation.

RESEARCH METHODS

To address the five research questions specified for this study, a survey research design was utilized. Data was collected with a mail questionnaire completed by a sample of local Tech Prep consortium coordinators in the United States. This section of the study presents a discussion of the population and sample for the study, the data collection instrument and procedures, and finally the approaches taken to analyze the data.

The Population

The population for the study consisted of all local Tech Prep consortia that were reported to exist in the United States and District of Columbia as of June 1, 1993. A total of 855 local Tech Prep consortia were identified through telephone interviews conducted during the spring of 1993 with all state Tech Prep coordinators. These state coordinators provided documentation showing the name and address of contact persons for all 855 local Tech Prep consortia, thereby providing the population for the study.

The Sample and Survey Response Rate

The study involved a sample of the nation's 855 local Tech Prep consortia. The sampling process was devised to ensure that local Tech Prep consortia from all 50 states would be represented in the study.[3] Since grant awards and funding of local consortia by

[3] Two interrelated factors contributed to the final sampling design for this study. First, due to other federally supported surveys involving local Tech Prep coordinators conducted by the U.S. Department of Education, the researchers were concerned about burdening local Tech Prep coordinators with another major mail questionnaire during 1993. Based on this fact, the surveys settled on a sample rather than census approach. Second, this study followed two prior years of data collection conducted by the authors to examine Tech Prep implementation activities by the 50 states, particularly related to the relationships

the states varied widely (as was discussed previously in this document), it was determined that the study should involve representation from all 50 states. Therefore, sample selection occurred on a state-by-state basis, ensuring that all the states would have at least one local consortium represented in the total sample. Within each state, local consortia were selected on a random or purposive basis depending upon the number of local consortia funded as of June 1, 1993.

For example, when more than 10 local consortia were funded by a state, 50% of the consortia were randomly selected. Of all 50 states, 33 states had more than 10 local consortia. Therefore, in each of these states, 50% of the local consortia were randomly selected resulting in the selection of 396 sites. In the remaining 17 states and the District of Columbia where there were 10 or fewer local consortia, all sites were purposively selected, resulting in the inclusion of 77 sites. By combining the consortia selected randomly and purposively, a total of 473 local consortia were selected for the study. This number of consortia represented 55% of all local Tech Prep consortia in the nation as of June 1, 1993.

Of all 473 local consortia in the sample, 397 provided usable questionnaires that were included in the final data analysis. Thus, the overall response rate was 84%. Table 15 in Appendix A shows the population of local Tech Prep consortia in the United States and District of Columbia as of June 1, 1993, on a state-by-state basis. This table also shows the number of consortia sampled and the number and percentage of consortia responding to the survey, all on a state-by-state basis.

Questionnaire Development

A mail questionnaire was developed for this study based largely on information collected via previous library, survey, and field-based research conducted by the authors. The sixteen-page booklet of closed- and open-ended items was organized into five parts: (1) Tech Prep goals and outcomes, (2) the stage of implementation of Tech Prep,

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between local and state policy and practice. Since the knowledge base created by this previous research included information from all 50 states and the District of Columbia, it was crucial to the researchers' current and future work to involve all 50 states and DC in this study. Taken together, these factors contributed to the development of a sampling procedure that differed from either a census or simple random sample. Consequently, the sampling design that was used (combined with the high response rate ultimately obtained) was thought to be adequate to consider findings from this study to be representative of the population of local Tech Prep consortia in the United States.

(3) barriers to Tech Prep implementation, (4) Tech Prep consortium characteristics, and (5) Tech Prep coordinator background. A summary of the items contained in each of these sections is presented in Figure 1. (See Appendix B for a complete copy of the instrument with the aggregated data provided by all survey respondents.)

Figure 1
Summary of Local Tech Prep Implementation
Questionnaire Sections and Items

Tech Prep goals and outcomes	• Formally stated Tech Prep components • Primary goal of Tech Prep initiative • Types of committees or teams • Primary target groups • Vocational program areas • Focus of Tech Prep curriculum reform • Educational reform implementation • Student outcomes • Support of interest groups
Stage of implementation of Tech Prep	• Stage of thirty components • Stage of the overall initiative
Barriers to Tech Prep implementation	• Level of impact of fifty barriers
Tech Prep consortium characteristics	• Types of organizations participating • Secondary and postsecondary personnel participation • Most successful inservice activity • Population of Tech Prep consortium service area • Setting of people in service area • Sources and amounts of grant funds • Allocation of funds to Tech Prep activities
Tech Prep coordinator background	• Months employed as coordinator • Years employed in educational setting • Hours per week spent on Tech Prep • Organization of employer • Previous work experience • Highest educational degree

Validity

To ensure the content validity of the instrument, a national panel of Tech Prep experts reviewed a draft of the instrument in April and in early May of 1993. Based on feedback from these experts, the questionnaire was revised and mailed to local and state practitioners in California, Illinois, Maine, New York, Texas, and Virginia in May of 1993 for a pilot test of the instrument. Several relatively minor modifications were made to the questionnaire based on feedback received from these practitioners, including rewording, revising, and omitting questions.

Reliability

Cronbach's alpha was used to determine the reliability of sections of the survey containing subscales. The Cronbach's alpha reliability coefficient was calculated for four subscales used in the survey. Each subscale and Cronbach's alpha coefficient are described in this section of the report.

Regarding the first of the four subscales, respondents were asked to indicate the level of priority given 17 student outcomes statements on a five-point scale ranging from 1 for "very low" to 5 for "very high." Respondents could also select a 9 indicating an outcome was not applicable to their Tech Prep initiative. For this subscale, the Cronbach's alpha coefficient was .89.

A second subscale focused on the support for Tech Prep received from 13 different interest (i.e., stakeholder) groups. Respondents were asked to indicate if the level of support was "poor" (1), "fair" (2), "good" (3), "excellent" (4), or "not applicable" (9). The Cronbach's alpha for this subscale was .67. We speculated that the reliability of this subscale was lowered by the relatively high use of the "not applicable" category for some of the items. In fact, when this category was dropped from the analysis and calculations were performed on the remaining data, the Cronbach's alpha coefficient was .82.

A third subscale focused on the stage of implementation of 30 potential components of a Tech Prep initiative. A five-point scale was utilized for this question as follows: "not begun" (1), "planning" (2), "development" (3), "initial implementation" (4), and "advanced implementation" (5). Each of these categories was defined explicitly in the questionnaire. Respondents could also indicate that a particular component was "not addressed" (9) by

their local consortium. For this "stage of implementation" subscale, the Cronbach's alpha coefficient was .93.

Finally, a fourth subscale focused on the level of impact of 50 barriers to local implementation. This six-point scale specified the level of impact for the barriers ranging from "none" (1) to "very major" (6). The Cronbach's alpha for this subscale was .94. Three of the four Cronbach's alpha coefficients were highly reliable; the alpha coefficient for the subscale indicating the level of support of interest groups for Tech Prep indicated a moderately high level of reliability.

Questionnaire Administration

Administration of the mail questionnaire occurred in four waves, based largely on procedures developed by Dillman (1978). In wave one, the questionnaires and pre-addressed, stamped envelopes were mailed on June 7, 1993, to the total sample of 473 local consortia. At the same time, each state Tech Prep coordinator was mailed a copy of the questionnaire, along with the final list of all consortia in the state selected for the study. All local coordinators who received a copy of the questionnaire were asked to complete the instrument and return it by June 30, 1993. In wave two, on June 14, a postcard was mailed to all local consortia explaining that they should have received the questionnaire and asking them to return the instrument by no later than June 30, 1993.

In wave three, at approximately one week prior to June 30, another postcard was mailed to all local consortia coordinators who had not yet responded; it requested completion and return of the questionnaire by June 30. At this time, state coordinators were also notified about their state's overall response rate and asked to assist with obtaining a 100% response rate from their state. In wave four, in early July, all non-respondents were mailed a questionnaire and stamped envelope and asked to complete the instrument by July 25, 1993. Throughout the month of August, surveys returned by local consortia were accepted. On September 1, 1993, the data collection phase of the study was concluded.

Data Analysis

Data obtained from this study was coded and entered into a spreadsheet package and analyzed with SPSS for the Macintosh. Simple descriptive statistics such as frequency distributions, measures of central tendency, cross tabulations, and correlations were computed for all quantitative data. Open-ended items were analyzed using an inductive content analysis procedure described by Patton (1980) and Guba and Lincoln (1985). In this process two members of the project staff read and reread the open-ended responses independently to identify major themes thought to portray the data in a meaningful and comprehensive way. In most cases, the themes identified through this content analysis process were very similar between the project staff, requiring only slight modifications to the labels used for classification of the data. In cases where the themes were coded and classified differently by the project staff, the discrepancies were reviewed and consensus was reached on the themes, classification scheme, and labels used to represent the data.

Finally, it is important to note that, as would be expected with a relatively large dataset such as this one, there were minor deviations in response rates to the various sections and items of the survey. To be able to use as many questionnaires as possible for the statistical analysis, we included nearly all of the questionnaires returned by respondents. This decision resulted in the inclusion of some questionnaires that contained varying amounts of missing data. Consequently, throughout the findings and discussion section of this report, when the number of respondents varied substantially from the number in the total sample of 397, that number is reported for tables and/or cells. Where missing data was thought to have a serious impact on the quality of data, we caution readers about interpretation of the findings. We also encourage readers to refer to Appendix B for aggregated responses to the entire survey and where response rates are reported on an item-by-item basis.

FINDINGS AND DISCUSSION

The findings and discussion section of this report is organized according to the five major research questions. First, findings related to Tech Prep consortia and coordinators are presented. Next, the goals, elements, outcomes, and focus of curriculum reform for local Tech Prep implementation efforts are discussed. Third, local coordinator perceptions of the progress of the overall Tech Prep initiative and its individual components is discussed. Fourth, barriers perceived to impact local Tech Prep implementation are presented. Finally, recommended changes to state and federal policy provided by local Tech Prep coordinator respondents to the survey are discussed.

Characteristics of Tech Prep Consortia and Coordinators

This section of the report presents findings related to the organizational composition, funding, settings, participants, and supporters of Tech Prep implementation activities carried out by local consortia. In addition, the characteristics of local consortium coordinators are discussed. This information provides a picture of the organizational composition and individual leadership that exist for local Tech Prep implementation efforts. Second, it helps give a valuable perspective for interpreting the remaining findings on local implementation presented in this report.

Organizational Composition of Local Consortia

Respondents were asked to estimate the number of organizations considered to be participants in Tech Prep implementation by local consortia during the 1992-1993 academic year based on the following categories: secondary schools, two-year postsecondary schools, four-year postsecondary schools, private-sector business and industrial firms, labor organizations, public community-based organizations, student leadership organizations, and other. The findings indicated that of all of these types of organizations, secondary schools, two-year postsecondary schools, and private-sector business and industry firms were the most likely to be identified as a part of a local Tech Prep consortium (see Table 1). Less than one-half of the local Tech Prep coordinators reported that their local consortia involved any other types of organizations. Of course, to reiterate the federal legislation, only secondary education agencies and postsecondary institutions were specifically mentioned as necessary partners in local Tech Prep consortia. These

findings indicate that the vast majority of local consortia were complying with this particular federal mandate during the 1992-1993 academic year.

Table 1
Organizations Participating in Local Tech Prep Consortia in the 1992-1993 Academic Year

Organizations	No. & Percent of Total Sample	Mean	SD	Median	Min.	Max.
Secondary schools	364 (92%)	11.60	11.15	8.00	1.00	80.00
Two-year postsecondary schools	349 (88%)	1.78	1.71	1.71	1.00	15.00
Four-year postsecondary schools	152 (38%)	1.64	1.19	1.00	1.00	10.00
Private-sector business and industry	287 (72%)	22.78	45.24	10.00	1.00	400.00
Labor organizations	91 (23%)	2.31	2.54	1.00	1.00	18.00
Public community-based organizations	164 (45%)	5.04	6.20	3.00	1.00	40.00
Student leadership organizations	83 (21%)	4.36	4.62	2.00	1.00	20.00

Interestingly, although the findings suggest rather consistent representation of secondary and two-year postsecondary educational organizations as well as business and industry firms, they also show wide variation in the number of these and other organizations participating in local consortia. Also shown in Table 1, the number of secondary schools participating in local consortia varied greatly, ranging from a minimum of one to a maximum of eighty. On average, less than one two-year postsecondary school was part of a local consortium; however, the findings indicated a wide range of responses from one to fifteen. Although missing data dictates using caution in generalization of enrollment findings collected via the questionnaire, respondents indicated that, on average, the number of students enrolled in the secondary school(s) in a consortium was 7,800; the

average combined student head count in the two-year postsecondary school(s) in a consortium was 7,104 (see Appendix B). (Note that these enrollment figures reflect total school head-count enrollment figures, *not* enrollment for Tech Prep only.[4])

Similar to the responses reported for secondary and two-year postsecondary schools, a range of responses was reported regarding the involvement of four-year postsecondary schools in local consortium activities. From one to ten four-year postsecondary schools were reported to take part in local consortia; however, note that only 38% of all local consortia surveyed reported involving four-year schools. This finding is worth pointing out because of findings discussed later in this report regarding the apparently limited support from four-year postsecondary schools for Tech Prep.

Also evident in the descriptive statistics shown in Table 1, the level of involvement of private-sector business and industry firms in local Tech Prep consortia was extremely varied, ranging from one to four hundred organizations. Although less frequently reported to be a part of local consortia, a similar pattern is apparent for all other types of organizations presented in the survey. These findings suggest the general idea of a "local consortium" varied widely in size as well as composition, raising the question of the intent of the local consortium as a delivery system for Tech Prep.

Estimates of the number of secondary and two-year postsecondary organizations in consortia suggest that the idea of Tech Prep has permeated many of the secondary and two-year postsecondary schools in the U.S. Based on an estimate of 1,140 community and junior colleges from the American Association of Community Colleges (1992) and an estimate of one two-year postsecondary school per local consortium (given our population of 855 Tech Prep consortia in the U.S. as of June 1, 1993), it appears that well over three-fourths of the nation's two-year colleges have some level of involvement with Tech Prep.

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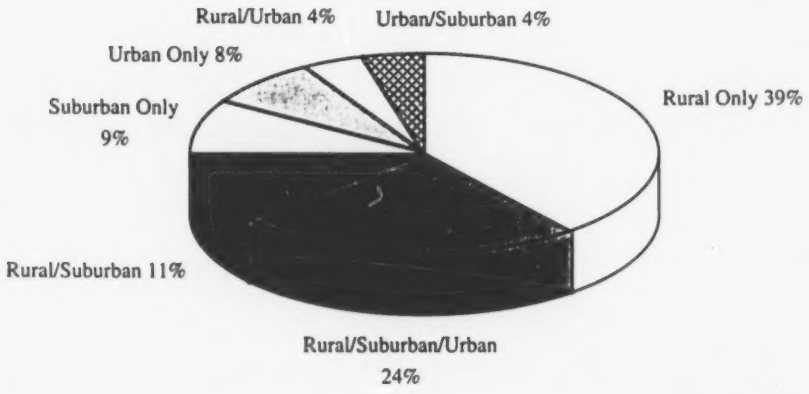
[4] At the time of this research study, there was no consensus on a definition of a Tech Prep student for the purposes of evaluating the federal Tech Prep Education Act legislation. In fact, the U.S. Department of Education's Tech Prep evaluation efforts included six possible definitions of a Tech Prep student (Mathematica Policy Research, Inc., 1993) as a beginning point for determining the level of participation of students in local programs. Due to this wide variation in the concept of "student," the researchers elected to *not* request data on the number of students participating in Tech Prep programs and, rather, solicit the total student enrollments in secondary and two-year postsecondary schools that were reported to be involved in local Tech Prep consortia. Although inadequate for describing the number of students directly participating in some sort of Tech Prep experience, the figure may provide an estimate of the number of students that could potentially be exposed to the concept as an alternative and evolving approach to secondary and/or postsecondary education.

Based on a U.S. Department of Education (1992) estimate of 20,406 public secondary schools and our estimate of an average of nearly twelve schools per consortium, approximately one-half of the nation's secondary schools could potentially be involved in local Tech Prep consortia throughout the nation. Although this represents an admittedly crude estimate, these figures indicate the concept of Tech Prep has been disseminated widely across the nation; it certainly goes much beyond the level of activity that occurred prior to passage of the federal Tech Prep Education Act.

Setting for the Local Consortia

Respondents classified their consortium areas as rural, suburban, urban, or combinations of these three settings. These findings indicate rural settings dominated local Tech Prep consortium service areas (see Figure 2). Thirty-nine percent categorized their settings as rural only, 24% reported having all three types of areas (i.e., rural, suburban, and urban) in the consortium, 11% said they had rural and suburban settings, and another 4% were rural and urban. Aggregating these numbers, 78% of respondents reported that their consortia were made up entirely or partially of rural areas, while the remaining 22% were either or both urban or suburban.

Figure 2
Settings of Residents of Local Consortia Service Areas



Funding of Local Tech Prep Initiatives

With regard to funding, 67% of those responding first received Perkins II Tech Prep funds in 1991 and 33% in 1992. The average Tech Prep (federal Title IIIE) grant amount was $97,343 (see Table 2), which represented the only source of funding for 42% of consortia. Nearly all the respondents to the survey (94%) indicated that their local consortia were receiving some level of federal funding for Tech Prep implementation. Respondents not included in this category either were not receiving federal funds or reported this information to be unavailable or missing.

Beyond the 42% of local consortia operating with only federal funds, 58% received funds from one or more of several sources for local Tech Prep implementation. These sources were from either local, other state or federal, the private-sector, or "other" resources. For the 25% of respondents having other state or federal funding, the contribution averaged $62,221. For the 37% reporting having local contributions, funds averaged $45,572. Only 11% of respondents indicated that they had private-sector business and industry contributions, and these averaged $9,228. "Other" contributions averaged $29,744 for the 5% of respondents reporting them. The average total funding per consortium was $130,987 with two-thirds of these funds coming from a federal Title IIIE grant and one-third from one or more other sources.

These findings indicate that although the federal Title IIIE monies were unmistakably important in funding local Tech Prep implementation, other funding sources could be substantial. In addition, when other grants were used—especially public grants—they were sizable. By comparison, private-sector funds appeared to be relatively scarce and small, pointing to a potential area of concern surrounding business and industry financial support for Tech Prep. Public policy has not mandated a financial commitment from business and industry for Tech Prep and our prior survey research with state Tech Prep coordinators has indicated that few, if any, states are mandating such support (Layton & Bragg, 1992). Therefore, consortia that have obtained financial support from business and industry have done so above and beyond a federal policy mandate.

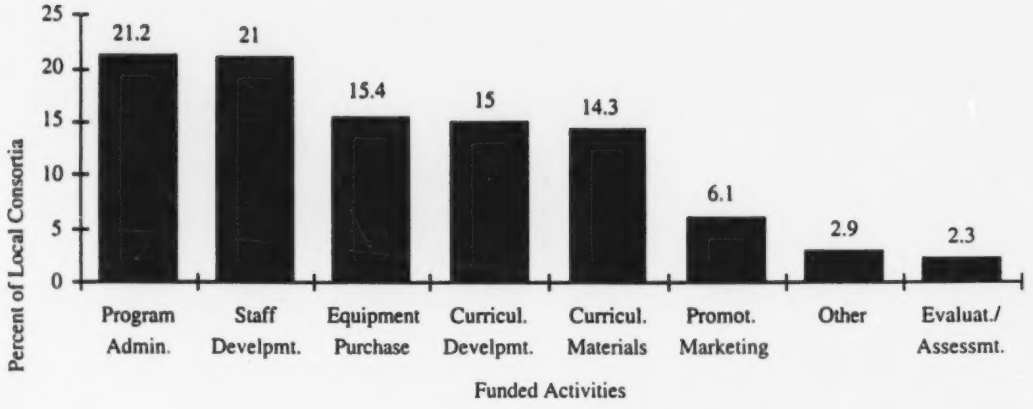
Table 2

Average Funds to Local Consortia by Source (Academic Year 1992-1993)

Source of Funds	No. & Percent of Total Sample	Mean	SD	Median	Min.	Max.
Tech Prep grant funds (Perkins Title IIIE)	373 (94%)	$97,343	$85,619	$70,800	$7,500	$625,000
State or federal grant funds *other* than Perkins Title IIIE Tech Prep	101 (25%)	62,221	82,026	30,784	2,000	500,000
Local funds	145 (37%)	45,572	66,649	25,000	1,400	475,000
Private-sector business & industry	42 (11%)	9,228	11,858	5,000	500	45,000
Other	18 (5%)	29,744	40,145	10,000	500	140,000
Total	383 (96%)	130,987	116,358	96,000	7,000	700,000

When provided with a list of seven categories of activities upon which the total amount of Tech Prep funds could be spent, respondents indicated the vast majority of funds were being spent in five areas: (1) program administration, (2) staff development, (3) equipment purchases, (4) curriculum development, and (5) curriculum and instructional materials purchases. Of these five, program administration and staff development were the categories receiving the largest percentage of funds (see Figure 3). Spending in these areas likely represented the emphasis of local consortia on organizing and managing consortium efforts as well as carrying out federally mandated professional development of education personnel. Funding for promotions and marketing, "other" activities, and program evaluation were much less extensive than these other five categories.

Figure 3
Percentage of Total Tech Prep Funds to Specific Activities for the Academic Year of 1992-1993[5]



Participation in a Tech Prep Consortium

Respondents were asked to estimate the number of personnel employed by secondary and two-year postsecondary schools in their consortia and the number involved in Tech Prep and participating in Tech Prep inservice. Due to a large number of missing responses, we advise caution in generalizing these findings widely; however, we believe they can be viewed as general trends in personnel involvement in Tech Prep. Table 3 provides a description of the mean responses on personnel involved in Tech Prep. (See Appendix B for individual cell sizes relative to the statistics presented in this table.)

Findings indicate that at the secondary level there were about five times the number of academic faculty in consortia schools as vocational faculty. The average number of secondary counselors employed averaged 31 and the number of administrators averaged 43. Approximately 50 to 60% of vocational faculty, counselors, and administrators at the secondary level were involved in Tech Prep; a slightly higher percentage participated in inservice. When looking at secondary academic faculty, the level of involvement with Tech Prep differed from the other three groups. Respondents indicated that less than one-third

[5] The total responses do not add up to 100% since respondents were asked to *estimate the percentage of funds* allocated during 1992-1993 to the following categories: program administration, curriculum development, staff development, promotions and marketing, equipment purchases, curriculum and instructional materials purchases, program evaluation, student (learner) assessment, and other.

of secondary academic faculty were involved in Tech Prep and slightly over 40% had been involved in Tech Prep inservice.

A similar pattern emerged at the postsecondary level, although the percentages of personnel involved with Tech Prep and participating in inservice activities were lower than at the secondary level. On average, academic faculty outnumbered vocational faculty employed in two-year postsecondary schools in local consortia, yet they were underrepresented relative to vocational faculty in Tech Prep activities and inservice. On average, about one-half of vocational faculty, counselors, and administrators at the two-year postsecondary level were involved in Tech Prep and had participated in inservice activities compared to roughly one-third of the academic faculty.

Table 3
Faculty, Counselor, and Administrator Participation in Tech Prep and Inservice

Personnel	Mean Number Employed	Mean Percentage involved in TP	Mean Percentage in TP Inservice
Secondary Education			
Vocational faculty	91.8	53.7%	59.8%
Academic faculty	505.0	29.9%	42.5%
Counselors	31.6	61.4%	67.4%
Administrators	43.5	56.4%	60.5%
Postsecondary Education			
Vocational Faculty	53.8	47.5%	49.9%
Academic Faculty	92.9	31.2%	36.7%
Counselors	8.5	56.5%	50.6%
Administrators	18.4	53.7%	53.8%

The content of Tech Prep inservice activities varied widely according to respondents who provided information about their most successful Tech Prep inservice. Inservice activities were particularly diverse in the subject matter addressed and in the way professional development was carried out. The following subjects were reportedly addressed by Tech Prep inservice:

- academic and vocational integration
- alternative assessment
- applied academics
- articulation
- business/industry partnerships with education
- career education
- cooperative learning
- critical thinking
- curriculum development
- guidance and counseling
- leadership
- learning styles
- national skills standards
- outcomes and outcomes-based education
- SCANS (Secretary's Commission on Achieving Necessary Skills) competencies
- special needs education
- strategic planning
- teaching methodologies
- team building
- Tech Prep awareness
- total quality management (TQM)
- workforce development
- youth apprenticeships

Of all these subjects, the topic of applied academics was by far the most prominent among Tech Prep inservice activities reported. It was followed by academic and vocational integration, curriculum development, and guidance and counseling. These topics were addressed through formats that ranged from local efforts to national conferences that

involved multiple avenues of professional development. Prominent among these methods of delivering inservice at the local level were the following: summer curriculum development institutes, general awareness meetings for large groups of local school personnel, one- or two-day conferences involving external experts/speakers and local business/industry representatives, monthly team meetings, and tours and exchanges of educators with business/industry. Listed below are five responses that portray multiple strategies of professional development being carried out at the local level:

1. Information/awareness sessions were conducted with each of the member institutions in a consortium. Each member institution identified one or two teams to participate in team building, leadership development, planning, and curriculum development. Additional training occurred throughout the year for the teams, culminating in a two-week summer institute focusing on curriculum development.

2. Personnel employed by local industries, school systems, and a community college joined together to form a sharing group with three goals: (1) develop partnerships, (2) facilitate involvement of school personnel and students in TQM, and (3) enlighten local educators and students about local industry needs. Training sessions involved teachers in local industries.

3. A four-part inservice strategy was designed for teachers and counselors in a consortium. The four components involved (1) career guidance activities in the classroom, (2) business and industry tours, (3) computer-assisted career guidance, and (4) multicultural awareness and inclusion.

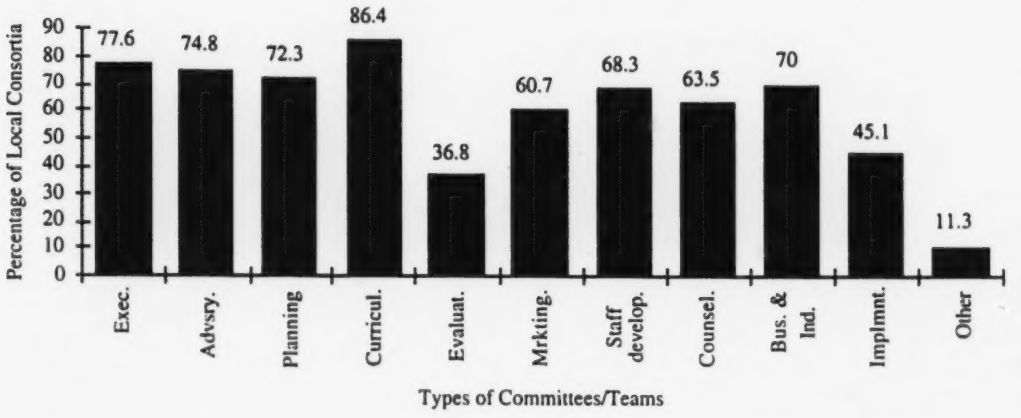
4. Structured visits were conducted with local business and industry for teachers to interact with workers at all levels. As a result of these visits, teachers considered the implications for curriculum and developed applied instruction across disciplines.

5. A regional state university involved interdisciplinary teams of secondary and postsecondary educators in a graduate-level course on Tech Prep. The teams participated in classroom instruction as well as business/industry tours. As a result of participating in this course, participants received credit and a stipend while producing new articulation agreements and integrated vocational and academic curriculum.

Committee/Team Involvement

Respondents were directed to review a list of potential committees or teams that could be formed within a consortium, and asked to indicate the ones that were active in their consortium during the 1992-1993 academic year. Based on these findings, the most active committees or teams for Tech Prep were those involved with curriculum (see Figure 4). Other committees or teams that were reportedly active in a majority of consortia were the following: executive/governing, advisory, planning, business/industry collaboration, staff development, counseling/guidance, and promotion/marketing. Committees or teams that were indicated to be less active were those involving implementation, evaluation, and other areas. We speculate these committees/teams were less active for several reasons: (1) Tech Prep is at an early stage of development so practitioners do not consider themselves to be at the point where implementation or evaluation commissions or teams were needed, (2) the functions of these teams were subsumed by other types of committees or teams (e.g., planning, curriculum) or are carried out in some other way (e.g., individuals or other organizations), or (3) local consortia assigned a lower priority to these functions so that committees or teams were not viewed as needed to carry out these activities.

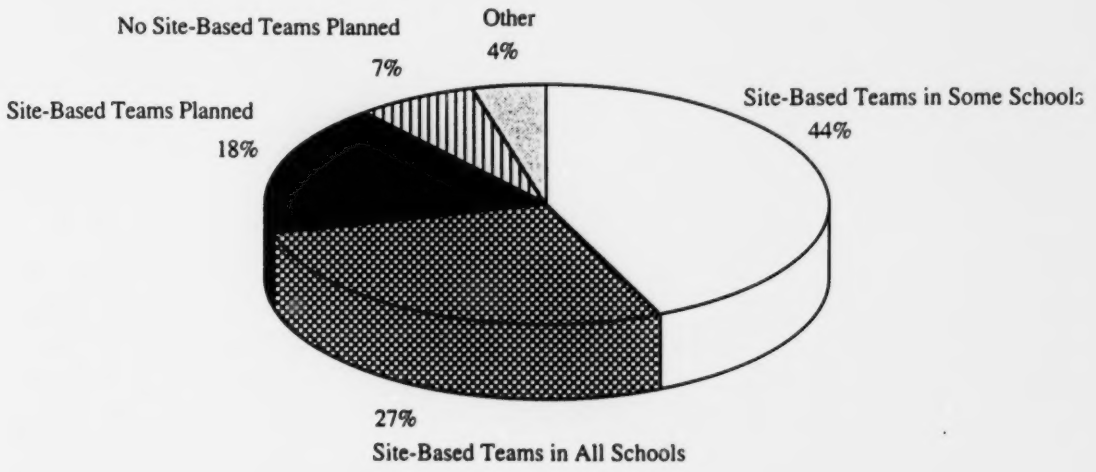
Figure 4
Functional Areas of Committees/Teams for Tech Prep
(Academic Year 1992-1993)[6]



[6] These percentages do not add to 100% since multiple responses were permitted. If fact, as was pointed out in the introduction of this report, it would be anticipated that local consortia would have more than one type of committee or team operating on behalf of a local Tech Prep implementation effort.

In a related question about the types of committees/teams being used in local consortia, a majority of those surveyed reported using either site-based committees/teams operating at either some (44%) or all (27%) of the schools to develop and implement Tech Prep (see Figure 5). An additional 18% responded that on-site teams were not being utilized but were planned for the future. Seven percent were not planning to use site-based committees/teams.

Figure 5
Site-Based Committees and Teams Involved with Tech Prep



Level of Support of Interest Groups

The survey prompted respondents to indicate their perceptions of the level of support of several interest groups, with the range of responses being from one to four, representing "poor" to "excellent." Interest groups perceived to give the highest levels of support for Tech Prep implementation, based on mean responses in the "good" to "excellent" range (3.0 to 4.0) were state agency personnel, vocational faculty, local two-year postsecondary administrators, business and industry representatives, local secondary administrators, students, and secondary school board members (see Table 4).

All other groups were reported to provide support in the fair to good range (2.0 to 3.0). This second set of groups—those perceived to be less supportive than the first set—included counselors, academic faculty, and parents. Especially low on the scale was the level of support perceived for four-year college and university personnel, with a group

mean of 2.22. It is also interesting to note that a fairly high percentage of three of the groups were indicated to be "not applicable" as an interest group for Tech Prep. These were four-year college and university personnel, college trustees, and labor union representatives. These findings point to a lack of consensus surrounding the level of support and also potentially the role of these groups, especially for four-year colleges and universities. This is evidenced by nearly one-half of the respondents who perceived the level of support of four-year colleges and universities to be in the range of poor to fair, another 7% indicated the level of support to be excellent, and another 24% reported it to be not applicable.

Table 4
Level of Support for Tech Prep from Interest Groups as Perceived by Local Coordinators

	Level of Support						
Interest Group	Poor	Fair	Good	Excellent	NA	Mean	SD
State agency personnel	2.5%	9.2%	30.3%	53.7%	4.3%	3.41	.77
Vocational faculty	1.3%	8.9%	38.5%	51.1%	0.3%	3.40	.70
Local two-year postsecondary administrators	1.5%	11.4%	36.2%	50.4%	0.5%	3.36	.74
Business/industry representatives	2.3%	10.2%	37.6%	47.2%	2.8%	3.33	.76
Local secondary administrators	2.5%	17.0%	41.3%	39.2%	0.0%	3.17	.80
Students	2.0%	14.6%	48.3%	25.3%	9.7%	3.07	.73
Secondary school board members	3.6%	20.6%	39.1%	31.2%	5.6%	3.04	.84
Parents	2.3%	20.4%	48.5%	19.1%	9.8%	2.93	.73
Counselors	5.3%	26.1%	43.0%	25.1%	0.5%	2.88	.85
Academic faculty	4.3%	30.5%	43.7%	21.1%	0.5%	2.82	.81
College trustees	9.3%	14.5%	24.3%	20.2%	31.8%	2.81	1.01
Labor union representatives	7.5%	13.7%	13.2%	11.9%	53.6%	2.64	1.04
Four-year college/university personnel	20.2%	25.6%	23.0%	6.9%	24.3%	2.22	.94

Local Tech Prep Coordinator Profile

Findings indicate that the tenure of local Tech Prep coordinators was similar to the funding pattern for Tech Prep grants. (Recall that one-third of the consortia were first funded in 1992 with Title IIIE monies; two-thirds were first funded in 1991 with these federal dollars.) Findings in Table 5 indicate that 26% of the respondents had been working as a local Tech Prep coordinator for twelve months or less; another 41% had been in the coordinator role for between thirteen and twenty-four months. Finally, another 33% had been working as a local coordinator for longer than twenty-four months, which may be indicative of the relatively small number of consortia operating Tech Prep-type programs prior to having federal Tech Prep funds in 1991 or 1992.

Table 5
Coordinator Work Experiences with Tech Prep

Tech Prep Work Experiences	Percent
Number of months as a Tech Prep coordinator (*n*=397)	
1-6	6.0%
7-12	20.4%
13-18	18.9%
19-24	22.2%
25-30	15.6%
31-36	2.5%
36+	14.4%
Organization employing immediate supervisor (*n*=397) (a)	
Two-year postsecondary college	52.9%
Secondary school	32.7%
Other	17.6%
Four-year postsecondary college	2.8%
Business and industry	1.3%
Position funded as (*n*=384)	
Full-time	37.0%
Part-time	38.0%
Not funded (part of regular job)	20.8%
Other	4.2%
Hours per week spent on Tech Prep (*n*=386)	
1-20	44.3%
21-40	32.5%
41 or more	23.2%

(a) These percentages do not add to 100% since multiple responses were permitted.

Two-year postsecondary schools were the largest employer of Tech Prep coordinators with just over 50% of the respondents reporting their immediate supervisor to be at that level. Secondary schools employed another 33% of the coordinators. "Other"

organizations were also reported fairly prominently as an employer. Examples of "other" organizations were public school districts, state and regional agencies, and vocational-technical schools. Relatively few coordinators were employed by four-year postsecondary schools or business and industry.

In terms of the amount of time spent on Tech Prep by local coordinators, findings suggest slightly over one-third of the coordinators were full-time. Most coordinators were working on Tech Prep part-time or as a part of another regular job. Twenty-one percent of the coordinators had the duties of Tech Prep added to their existing full-time responsibilities. These job descriptions were backed up by the number of hours coordinators reported working on Tech Prep. The average number of hours per week spent on Tech Prep activities was about 28; 44% of those responding spent twenty hours or less per week on Tech Prep, while 23% spent more than forty hours.

Respondents were also asked to indicate any previous professional work experience. Approximately one-half had been educational administrators or vocational teachers; about one-third had been academic teachers (see Table 6). Twenty-nine percent had worked in business and industry. A smaller percentage had had work experience such as university teaching or research, or guidance and counseling. Examples of the other work areas reported by coordinators were community college, consulting, federal government, and the military.

As a group, local coordinators were highly experienced and educated. About 55% had been employed in an educational setting for twenty-one years or more (see Table 6). Over 80% had obtained a master's or doctoral degree. Although respondents were not asked to indicate their gender, a rough estimate was made based on a classification of the names provided. Forty-eight percent could be identified as male, 47% as female, and 5% could not be determined.

Table 6

Tech Prep Coordinator Work and Educational Background

Background	Percent
Previous professional work experience (*n*=397) [a]	
Educational administration	53.1%
Vocational teaching	47.4%
Academic teaching	33.5%
Business/industry employment	28.5%
University teaching/research	16.1%
Guidance/counseling	14.6%
Other	13.4%
Years employed in an educational setting (*n*=397)	
1-10	19.9%
11-20	25.5%
21-30	38.8%
31 or more	15.9%
Highest educational degree obtained (*n*=389)	
Master's degree	63.5%
Doctoral degree	20.2%
Bachelor's degree	11.3%
Associate's degree	2.8%
Other	2.3%

[a] These percentages do not add to 100% since multiple responses were permitted.

Goals, Elements, Outcomes, and Curriculum Reform

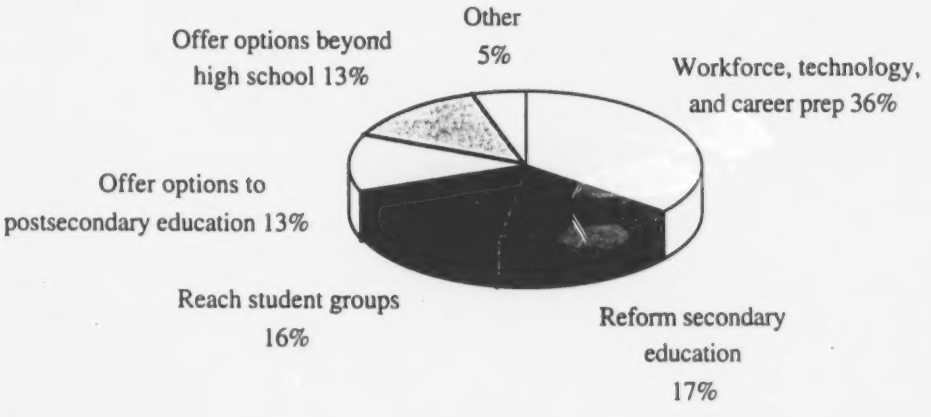
This section of the report presents findings related to the general purpose and focus of local Tech Prep initiatives. Included in this section are the primary goals that local coordinators gave for their Tech Prep initiatives and the formally stated elements, vocational program areas, target student groups, and student outcomes of Tech Prep.

Finally, this section presents findings related to curriculum reform specifically related to Tech Prep as well as other educational reform endeavors.

Primary Goal of Tech Prep

Respondents were asked to write a brief statement about the one primary goal of their consortium's Tech Prep initiative. A content analysis of the responses was conducted by using an inductive coding method discussed by Patton (1980) and Guba and Lincoln (1985) in which data was coded independently by two project staff members. Based on this process, the findings were grouped into six thematic areas (see Figure 6). The most prominent of the six themes was the goal of Tech Prep to enhance the workforce through educational programs involving technology and career preparation; this goal was described by over one-third of those surveyed. Respondents with this goal tended to focus their remarks on a vision of Tech Prep that emphasized preparing students for increasingly technological and competitive workplaces. Quite often respondents described preparing students for employment in technological careers in "tomorrow's market place" or "work in the 21st century."

Figure 6
Primary Goal of Local Tech Prep Initiative


Other
5%
Offer options beyond high school 13%
Workforce, technology, and career prep 36%
Offer options to postsecondary education 13%
Reach student groups 16%
Reform secondary education 17%

The next four areas of goals were identified by 13 to 17% of the respondents. First, reform of secondary education was a goal that seemed to reflect the desire to meet needs linked to secondary school curriculum. Chief among these was a focus on using

Tech Prep to "eliminate" or "replace the general track," change teaching and learning processes, add applied academics or create other forms of integrated vocational and academic curriculum, and raise academic standards for high school graduates.

A second goal area was directed at reaching various student groups with Tech Prep curriculum. Statements typical of this goal were "develop the 'neglected majority'" and "meet the needs of unfocused youth." Relative to this goal, a few respondents described Tech Prep as for *all* students. Representative of this viewpoint were the following comments: "broader educational opportunities for 'all' students" and "ensure that all students receive appropriate career and academic guidance to prepare all students for rapidly changing technology."

A third goal area focused on a vision of Tech Prep linking secondary education to more options for students in postsecondary education. In these statements, the purpose of Tech Prep was described as articulating secondary and postsecondary curriculum and increasing student matriculation into postsecondary education. Statements that were grouped into this category focused on the importance of student outcomes related to reaching some form of postsecondary education, usually the two-year college level. A statement reflecting this goal was "institute a seamless, nonduplicative sequence of courses from grades 11-14, based on formal articulation agreements."

Statements included in the fourth goal area described a vision of Tech Prep focusing on preparing youth for multiple options beyond high school, including postsecondary education, employment, or military service. Typical of this goal was the following statement: "improve the quality of vocational education by restructuring secondary and postsecondary curricula for work . . . to prepare graduates for the workplace or for continuing education" and "[T]o build student awareness of career goals and assist in their transition to work and/or postsecondary education."

Relatively few respondents described a primary goal for Tech Prep other than those just described. Statements that were categorized as "other" focused on views that Tech Prep was primarily a mechanism for faculty and staff professional development, increased community involvement in education, and meeting broad societal needs.

Before moving on to discuss other findings, it is important to point out that the goals described by respondents were very diverse. Within the various categories created by our content analysis, there were a number of contradictions, raising questions about the level of consensus surrounding Tech Prep as local implementation occurs across the nation. Most significant of these differences were views of Tech Prep as a curriculum track versus entire curriculum, and as an educational approach for particular student groups (e.g., "neglected majority") versus all students. It seems that the ambiguity of Tech Prep definitions and goals discussed in the introduction of this report continues to be an issue with local implementation efforts.

Elements of Tech Prep

The questionnaire asked respondents to select from a list of 14 elements those which their consortia had stated in writing as a primary focus of Tech Prep. The ranking of these elements is shown in Table 7. Findings indicate that 13 of the 14 elements are included in a majority of respondents' printed materials as a focus for Tech Prep. Six elements were identified by over 90% of the respondents as being formally stated in writing. These were formal articulation agreements, integrated vocational and academic curriculum, career guidance, educator and employer collaboration, equal access for special populations, and common core curriculum. Other elements appearing in the federal legislation as "essential elements" such as training of teachers and counselors and preparatory services were also identified by the vast majority of respondents as formally stated in official consortium documents. Although not currently specified in federal legislation, two-thirds of the respondents also indicated that work-based learning is formally stated as a focus of Tech Prep. Respondents were least likely to have mentioned employment assistance and job placement services, possibly because of the early stage of implementation. In all, these findings suggest there is a fairly high degree of consensus around at least six (and probably another four) of the elements as being important to Tech Prep.

Table 7

Elements Formally Stated as Foci of Tech Prep Initiative

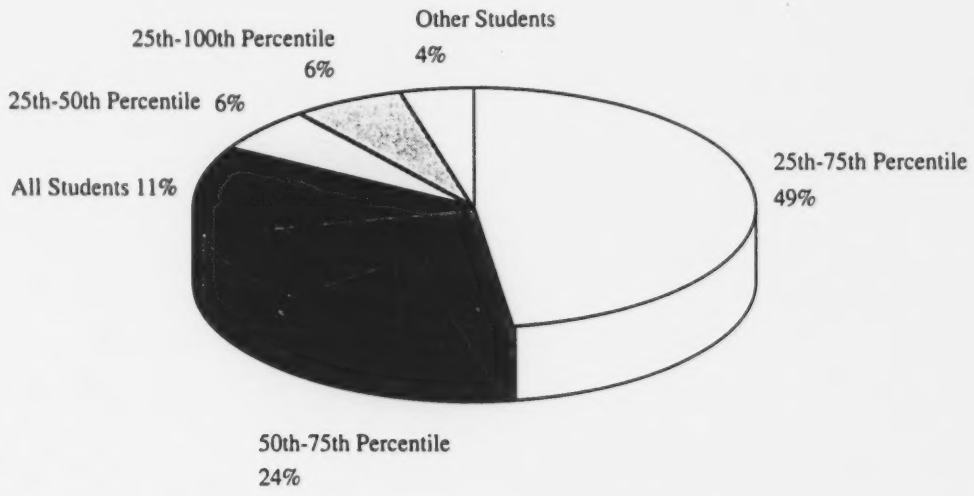
Element	Percent
Formal articulation agreements to create 2+2 program-area course sequences between secondary and postsecondary schools	96.4%
Integrated vocational and academic curriculum	95.6%
Career guidance including career awareness and exploration	93.6%
Collaboration between educators and employers	92.5%
Equal access to the full range of Tech Prep for special populations	91.9%
Common core curriculum in math, science, and communications (including applied academics) and technologies leading to an associate's degree, certificate, or apprenticeship in a career field	91.9%
Joint inservice training for teachers from the entire consortium	89.9%
Marketing of Tech Prep programs	87.0%
Training programs for counselors	82.5%
Preparatory services for all participants in Tech Prep	78.5%
New teaching methods such as cooperative learning appropriate for varied student needs and learning styles	71.9%
Work-based learning experiences (e.g., youth apprenticeships, cooperative education, school academies)	67.7%
Alternative learner assessment (e.g., performance assessment, portfolios)	60.5%
Employment assistance and job placement services	46.8%
Other	11.0%

Student Population

Respondents were asked to indicate the primary target group of students for their local Tech Prep initiative. Findings indicate that the middle majority of students was the target group for nearly one-half of respondents (see Figure 7). Additionally, almost one-quarter of the respondents indicated that the 50th-75th percentile group was the primary target group. Together, these two responses account for nearly three-quarters of all

respondents and indicate that consortia were directing their efforts to students in the middle quartiles of academic ability, and especially to students in the second quartile (i.e., 50th-75th). Students in the two extreme quartiles were much less likely to be identified as target groups for Tech Prep. This finding is consistent with the view that Tech Prep is for students whose academic performance places them in the middle of the high school curriculum. It seems apparent that many local Tech Prep coordinators have adopted the perspective that Tech Prep can fill the gap in high school curriculum for the "neglected majority."

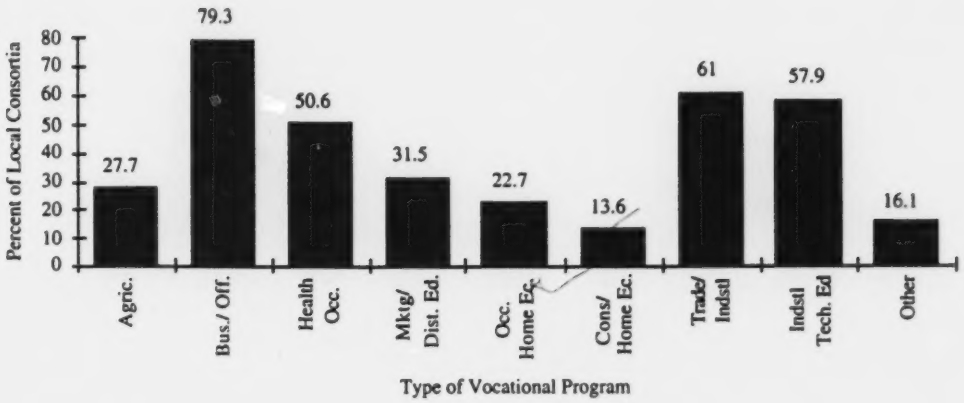
Figure 7
Primary Student Target Groups for Tech Prep by Class Rank Percentiles



Vocational Program Areas for Tech Prep

Over one-half of the respondents indicated that Tech Prep involved one or more of four vocational education program areas (see Figure 8). Business and Office was a focus of 79% of Tech Prep initiatives, followed by Trade and Industrial reported by 69% of the consortium coordinators. Industrial Technology Education was the next most prominent vocational area for Tech Prep as it was reported to be part of about 60% of the local consortia surveyed. A fourth vocational area, Health Occupations, appeared in slightly over 50% of the consortia. Less than one-third of the consortia reported involving any of the remaining vocational program areas such as agriculture, marketing/distributive education, or various areas of home economics.

Figure 8
Vocational Program Areas Involved in Tech Prep



Student Outcomes

The respondents were given seventeen student outcomes and asked to rate the level of priority of each according to the following scale: 1 = very low; 2 = low; 3 = moderate; 4 = high; and 5 = very high. Using the mean responses for discussion, Table 8 shows that all but two of the student outcomes were given a high level of priority. These outcomes reflect a rather broad array of outcomes pertaining to vocational-technical and academic education, workforce preparation, employability, and so forth. The three student outcomes that topped the list were improved knowledge and skills in math; increased problem-solving, thinking, and reasoning skills; and improved employability skills and work readiness. Each of these three student outcomes had a mean average of 4.5 or greater on a 5-point scale and over 60% of the respondents rated these outcomes as having a "very high" priority.

The next group of student outcomes had mean scores falling between 4.0 - 4.49 on the five-point scale and were also considered to be a high priority. Chief among these 12 outcomes were increased matriculation from secondary to postsecondary, increased awareness of and interest in technical careers, increased knowledge and skills in vocational-technical areas, and improved knowledge and skills in English/communications. Only two student outcomes fell in the moderate range and they were increased job placement rates and increased matriculation from two- to four-year colleges. Possibly, as Tech Prep becomes more fully developed and more students move through these programs, outcomes such as job placement and matriculation from two- to four-year postsecondary education

will take on greater importance. Clearly, further study is needed to follow students through their Tech Prep programs to learn what outcomes are appropriate and, more importantly, determine the extent to which particular outcomes are being met.

Table 8
Level of Priority of Student Outcomes for Tech Prep

Student Outcome	Level of Priority: Very Low	Low	Moderate	High	Very High	NA	Mean	SD
Improved knowledge and skills in math	0.3%	0.3%	5.1%	30.2%	63.7%	0.5%	4.58	.63
Increased problem-solving, thinking, and reasoning skills	0.0%	1.3%	2.8%	33.3%	61.8%	0.8%	4.57	.62
Improved employ. skills and work readiness	0.3%	1.0%	4.0%	33.2%	60.9%	0.5%	4.54	.65
Increased matriculation sec. to postsec. levels	0.3%	0.5%	7.6%	35.4%	55.5%	0.8%	4.46	.68
Increased awareness of/interest in tech. careers	0.5%	0.8%	6.4%	38.8%	53.3%	0.3%	4.44	.70
Increased knowledge and skills in voc. areas	0.3%	0.8%	7.9%	37.7%	52.9%	0.5%	4.43	.69
Improved knowledge/skills in English/comm.	0.0%	1.0%	8.9%	35.7%	53.8%	0.5%	4.43	.70
Improved knowledge and skills in science	0.5%	1.3%	9.6%	36.0%	51.7%	0.5%	4.38	.76
Increased motivation for learning	0.0%	0.8%	11.2%	39.3%	48.0%	0.8%	4.35	.71
Increased secondary school completion rate	0.5%	2.0%	15.1%	33.2%	47.7%	1.5%	4.27	.83
Increased interpersonal skills (team, leadership skills)	0.0%	1.8%	15.8%	39.0%	42.6%	0.8%	4.23	.78
Increased postsecondary school completion rate	1.0%	2.8%	18.8%	37.1%	36.5%	3.8%	4.09	.88
Increased employability in high-wage jobs	0.5%	2.3%	20.4%	40.1%	32.9%	3.8%	4.07	.83
Increased self-esteem	0.5%	2.0%	24.1%	39.6%	32.5%	1.3%	4.03	.84
Increased job satisfaction of students/graduates	0.8%	4.1%	21.4%	37.5%	32.7%	3.6%	4.01	.90
Increased job placement rate	0.8%	4.3%	21.7%	39.0%	30.6%	3.6%	3.98	.89
Increased matriculation from 2- to 4-yr. college	2.6%	14.4%	39.5%	25.4%	11.5%	6.7%	3.31	.97

Curriculum Reform and Tech Prep

Respondents were given a list of twelve potential curriculum reform options for Tech Prep that could be undertaken at the secondary and postsecondary levels. These options focused on several avenues of reform such as articulation, applied academics, work-based learning, and vocational and academic integration. Without a doubt, findings indicate that, regardless of the reform avenue attempted during the 1992-1993 academic year, the major thrust of Tech Prep curriculum work took place at the secondary level (see Table 9). Except in the area of articulation of vocational program sequences between secondary and postsecondary schools—a process that mandates that both levels be involved—secondary curriculum reform activities far surpassed those reported for the postsecondary schools in local consortia. However, even among curriculum reform activities carried out by secondary schools, much of the activity focused on the limited reform effort of adding courses to existing curriculum. For example, over three quarters of respondents indicated that their Tech Prep curriculum reform involved adding applied academics courses to existing secondary curriculum or replacing existing courses with applied academics courses. More exhaustive curriculum change such as implementing career academies, advanced-skills curriculum, or work-based learning occurred much less frequently.

Similar to their secondary school partners, postsecondary schools also undertook more frequently limited curriculum reform that involved existing courses. In fact, beyond indications of efforts to carry out formal articulation agreements and organize occupational/career clusters (sometimes already in place prior to newly funded Tech Prep efforts), the lack of curriculum reform among postsecondary schools in local consortia is alarming. Only three of the postsecondary reform activities were conducted by more than 50% of the local consortia, and eight of the thirteen activities were undertaken by less than 40% of the local consortia. Other curriculum reform activities were described by less than 10% of the respondents for either the secondary or postsecondary education levels. These reforms included adding SCANS competencies, developing a TQM component, enhancing student assessment, and developing youth apprenticeships and work experiences.

Table 9

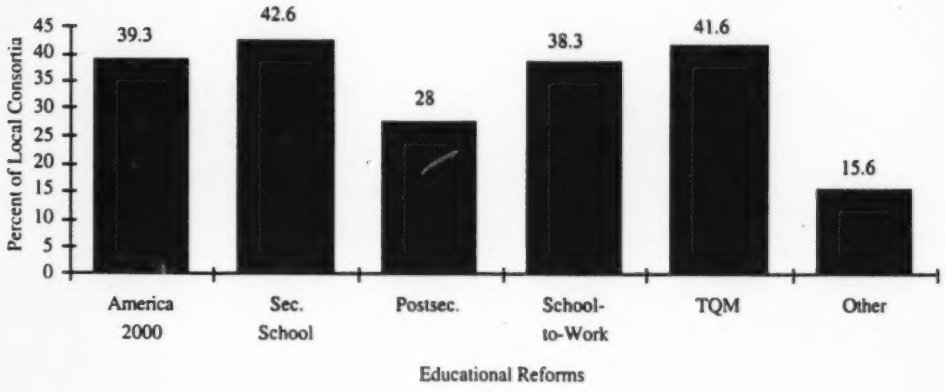
Tech Prep Curriculum Reform at the Secondary and Postsecondary Levels (Academic Year 1992-1993)

Tech Prep Curriculum Reform Efforts	*Secondary* Percent	*Postsecondary* Percent
Articulate vocational program sequences between secondary and postsecondary levels	89.5%	88.1%
Add applied academics (commercially or locally developed) to existing curriculum	86.4%	37.7%
Supplement existing vocational courses with academics	76.5%	42.7%
Replace existing curriculum with applied academics (commercially or locally developed)	77.9%	29.9%
Supplement existing academic courses with vocational	72.1%	34.3%
Articulate academic program sequences between secondary and postsecondary levels	69.6%	69.2%
Organize occupational/career clusters	68.9%	51.6%
Sequence and block schedule courses	56.5%	32.0%
Provide work-based learning	46.2%	39.8%
Add advanced-skills courses to the existing curriculum	40.6%	35.3%
Provide career academies	39.9%	23.3%
Provide interdisciplinary courses	37.4%	22.3%

A similar pattern of reform activity appears in responses to a question about other approaches to educational reform implemented in any of the secondary or postsecondary schools in the local consortia. Only 43% of the respondents indicated that schools in their consortia were involved in secondary school reforms, followed closely by 42% that reported having schools involved in TQM activities (see Figure 9). Third was the America 2000 initiative that was being undertaken by 39% of consortia, followed by school-to-work reforms that were being carried out by 38% of consortia. They were even less likely to report postsecondary/higher education reforms (28% participation) or "other" reforms

(16% participation). These findings reinforce the pattern of reform identified with Tech Prep showing that secondary curriculum reform activities surpassed reform at the postsecondary level.

Figure 9
Implementation of Educational Reforms by Local Consortia



Stage of Implementation of Tech Prep

This section presents findings related to the overall stage of implementation as reported by local coordinators. In addition, the stage of implementation of each of thirty components was rated by coordinators. Finally, implementation of the thirty components was examined in relationship to the year first funded with Title IIIE funds.

Stage of Implementation of Selected Components

Based on the federal legislation, an extensive literature review, and findings from the authors' previous research on Tech Prep implementation, thirty components that could potentially be part of Tech Prep were included in a subscale on stage of implementation. Respondents rated the implementation stage of these thirty components on a five-point scale where 1 = not begun, 2 = planning, 3 = development, 4 = initial implementation, and 5 = advanced implementation.[7] Responses were analyzed with frequency distributions, means, and standard deviations. Findings presented in Table 10 indicate that the means ranged from the planning stage to the initial implementation stage.

On average, local consortia reported being farthest along with consortium building giving it a mean rating of 4.10, indicating it to be at the initial implementation stage. In fact, over 80% of the respondents reported consortium building to be at the initial or advanced implementation stage. The only other component to obtain a mean rating of 4.0 was formal articulation agreements; it received a mean rating of 4.02. Nearly three-fourths of the respondents indicated this component to be at the initial or advanced implementation stage. Please note that the organization of a local consortium is a required component according to federal legislation; local consortia cannot receive federal funds without it. Additionally, formal articulation agreements are "essential elements" of Tech Prep according to the federal law. Thus, the fact that most local consortia reported implementing these components was not surprising.

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[7] The "stage of implementation" was based on a conceptual framework for Tech Prep implementation developed from prior NCRVE-funded research directed by Bragg (1992). The subscale follows: (1) *Not begun*—this indicated the component had not been addressed; (2) *Planning*—this included goal setting, staff orientation, the formation of committees and teams, and the development of plans for a component; (3) *Development*—this involved such activities as reviewing, designing, creating, and field testing a component; (4) *Initial implementation*—this occurred when plans and products of the development stage began to be carried out for a component; (5) *Advanced implementation*—this occurred when a component was routinely carried out, regularly reviewed and evaluated, and institutionalized so that it would continue even if current leaders were no longer responsible for Tech Prep; and (6) *Not addressed*—this indicated that a consortium did not intend to include the component in its Tech Prep initiative.

Table 10

Stage of Implementation of Tech Prep Components

Tech Prep Components	Not Begun	Plan	Develop	Initial Implement	Advanced Implement	NA	Mean	SD
Consortium building	0.8%	7.1%	10.4%	43.8%	37.2%	0.8%	4.10	.91
Formal signed articulation agreements	3.3%	15.8%	20.6%	39.9%	18.3%	2.0%	4.02	1.12
Joint inservice of secondary & postsecondary personnel	1.5%	9.9%	18.7%	46.1%	23.3%	0.5%	3.81	1.05
Team building to facilitate planning & implementation	3.8%	13.3%	25.8%	39.5%	17.1%	0.5%	3.80	.96
Equal access for all students	7.9%	20.6%	30.2%	27.4%	13.5%	0.5%	3.66	1.16
Development of 2+2 core technical & academic curriculum	4.1%	8.6%	16.2%	44.6%	26.6%	0.0%	3.61	1.07
Site-based planning & decision making	4.1%	19.2%	21.5%	39.5%	15.2%	0.5%	3.55	1.07
Long-range &/or strategic planning	18.0%	18.5%	20.6%	29.7%	11.7%	1.5%	3.53	1.05
Marketing & promotions	17.3%	26.0%	22.1%	23.2%	9.4%	2.0%	3.45	1.17
Inservice for counselors	5.6%	19.5%	29.1%	30.9%	14.4%	0.5%	3.43	1.09
Integration of secondary vocational & academic curriculum	4.0%	8.3%	12.4%	31.6%	42.7%	1.0%	3.30	1.02
Collaboration between vocational & academic educators	15.3%	15.5%	20.1%	27.5%	18.6%	3.1%	3.29	1.11
Career awareness & exploration for students	2.5%	15.9%	20.8%	38.5%	21.8%	0.5%	3.25	1.18
Guidance & counseling services	22.1%	23.2%	21.1%	23.9%	7.9%	1.8%	3.23	1.11
Labor market analysis to inform curriculum development	4.3%	17.7%	31.6%	34.9%	10.6%	0.8%	3.19	1.34
Use of new instructional strategies	19.1%	25.3%	23.3%	21.2%	7.8%	3.4%	3.19	1.14
Formal partnerships with business & industry	13.3%	24.0%	24.8%	25.8%	9.5%	2.6%	3.18	1.14
Strategies to address the needs of special populations	7.1%	22.7%	25.5%	31.1%	12.1%	1.5%	3.16	1.15
Preparatory services for all participants	17.9%	26.2%	22.6%	23.1%	7.7%	2.6%	3.14	1.17
Workplace professional development for teachers & counselors	7.3%	21.8%	24.8%	29.9%	15.9%	0.3%	2.98	1.30
Use of outcomes-based education	20.3%	27.3%	23.5%	19.5%	7.1%	2.3%	2.94	1.20
Evaluation of Tech Prep programs	37.9%	29.5%	15.3%	8.1%	2.5%	6.6%	2.91	1.19
Joint planning time for vocational & academic teachers	32.0%	22.0%	13.6%	14.8%	12.8%	4.9%	2.81	1.25
Alternative assessments	6.3%	16.2%	23.7%	32.8%	20.5%	0.5%	2.76	1.23
Integration of postsecondary vocational & academic curriculum	5.8%	22.2%	27.3%	31.8%	12.6%	0.3%	2.72	1.23
Development of advanced skills curriculum	3.3%	17.2%	18.0%	32.4%	28.9%	0.3%	2.72	1.22
Work-based learning for students	7.1%	24.0%	27.5%	27.5%	13.4%	0.5%	2.65	1.28
Job placement services for students & graduates	7.8%	24.3%	26.9%	25.8%	14.0%	1.3%	2.52	1.22
Computer monitoring of student progress	13.6%	24.5%	28.5%	23.0%	9.8%	0.5%	2.12	1.19
Apprenticeships spanning secondary & postsecondary education	39.4%	24.9%	16.0%	11.7%	3.8%	4.1%	2.01	1.08

Seventeen of the components had mean ratings on the stage of implementation scale of between 3.0 to 3.9, indicating that the vast majority of the thirty components were considered by respondents to be at the development stage. These components ranged from joint inservice (3.81) to preparatory services (3.14). Many of these components corresponded to curriculum and related support programs and services such as equal access, 2+2 core curriculum, guidance and counseling, new instructional strategies, and preparatory services. Still other components involved planning and development activities undertaken by consortium members to get Tech Prep programs into place such as team building, site-based planning/decision making, marketing and promotions, inservice, collaboration between vocational and academic teachers, labor market analysis, and formal partnerships with business and industry. Among the seventeen components at the development stage were several of the "essential elements" identified in the federal legislation. These were joint inservice of faculty, equal access for *all* students, development of 2+2 core curriculum, inservice for counselors, and preparatory services.

Eleven components were rated between 2.0 and 2.9 on the five-point implementation scale. Many of these components were highly specialized activities that have not been identified widely with the Tech Prep Associate Degree (TPAD) model or with the federal legislation. Interestingly, however, almost none of the respondents indicated that these components were not applicable to their Tech Prep efforts. Apparently the lower rating of these components was not so much an indication that the components were not considered important or that they would not be implemented, but that there had not been sufficient time or resources to fully plan, develop, and implement them.

Among these eleven components are several areas that deserve further discussion because their position on the list may be a precursor to other issues yet to be raised in this report. First, four components are associated with program evaluation or learner assessment. These components are (1) outcomes-based education, (2) evaluation of Tech Prep programs, (3) alternative assessment, and (4) computer monitoring of student progress. These findings suggest a lack of use of evaluation during the local implementation process; they also raise concern about difficulties in assessing student outcomes and other results as implementation of the programs progresses. The fact that respondents rated these evaluation-related components at the planning stage is positive in that they are recognized as a part of Tech Prep; however, their lagging stage of development relative to other components certainly raises concerns about missed

opportunities to use formative evaluation during implementation and problems with assessment of student outcomes in the future.

Second, joint planning time for vocational and academic teachers received a mean rating of 2.81, placing it between the planning and development stages. Seeing this component at such a low ranking is disconcerting because it has been identified as crucial to the success of faculty-driven educational reform efforts (Andrew & Grubb, 1992; Raywid, 1993). It is also discussed later in this report as a top ranked barrier to local Tech Prep implementation. Third, the appearance of postsecondary vocational and academic integration and advanced skills curriculum reinforces previously reported findings regarding the lack of extensive curriculum reform for Tech Prep, especially at the postsecondary level.

Finally, three other components that were rated at the bottom of the list raise concern about the strength of linkages between education and work relative to Tech Prep. Three of the four components appearing at the bottom were (1) work-based learning, (2) job placement, and (3) apprenticeships. One-fifth of the respondents indicated they had not begun work-based learning for students and approximately one-third had not yet addressed the apprenticeship or job placement components. These particular components were not "essential elements" of the federal Tech Prep legislation; however the new federal School-to-Work Opportunities Act (STWO) will require that work-based learning be conducted through some sort of model, including youth or traditional apprenticeship. Although not a direct finding from this study, this data implies that local consortia will need to give more serious attention to school-to-work activities such as work-based learning and apprenticeships if Tech Prep is to become a vehicle for helping students transition between formal education and the workplace.

Overall Stage of Implementation

Respondents were asked to review the ratings they gave the thirty Tech Prep components and, based on that assessment, to indicate the stage of implementation of their Tech Prep consortia overall. This rating was based on a four-point scale where 1 = planning, 2 = development, 3 = initial implementation, and 4 = advanced implementation. The vast majority of respondents perceived the progress of their local consortia overall to be at either the initial or advanced implementation stage. Almost one-quarter of respondents reported their consortia to be at the development stage, and slightly over

one-tenth reported them at the planning stage. These responses relate closely to a finding referred to previously in this report showing that approximately two-thirds of the respondents had received Title IIIE Tech Prep funds for two years, while one-third had received the funds for one year. In almost all states, second-year grants have been referred to as implementation grants and first year grants have been called planning grants. Therefore, to a significant extent, respondents rated the stage of implementation of their consortia in a way similar to the formal description states would have given their grants. Based on our understanding of how coordinators rated individual components, it seems the "implementation" label is not very useful in describing progress made on the overall Tech Prep initiative because it is not necessarily indicative of the level of advancement of activities being carried out by local consortia.

Staged Components by First Year Funded

The study examined whether there was a difference in rating of progress on the thirty Tech Prep components based on the year first funded with Title IIIE funds. The findings presented in Table 11 indicate that the year Tech Prep funds were first received was related to the stage of implementation of nearly all of the components. On average, local coordinators representing Tech Prep consortia funded in 1991 rated components higher than coordinators funded in 1992. Using a two-tailed *t*-test, the differences between the two groups (those funded in 1991 and 1992) were statistically significant for twenty-seven of the thirty components, indicating the two groups were different. Since nearly all components were rated higher in 1991 than 1992, it is interesting to examine the three components that were not rated differently by the two groups. They were (1) joint planning for vocational and academic teachers, (2) integration of vocational and academic education at the postsecondary level, and (3) apprenticeships. All were rated relatively low on the stage of implementation scale by both groups of coordinators. We suggest several possible conclusions about these findings. Possibly these three components may require more time to implement than only one additional year of implementation. Also, they may not have received a great deal of attention during the initial funding year. Another possibility is that these components may not represent activities that are viewed as a high priority by local Tech Prep consortia, in either the present or future. One or a combination of these explanations may be related to this particular finding, helping us to recognize the need to continue exploring the relationships among variables represented in this dataset.

In addition, since many of the thirty components were rated at only the development stage by consortia involved in Tech Prep for one or two years, a concern is raised about the likelihood of these components reaching the initial or advanced implementation stages by the time consortia may have their three-year grants end.[8] Based on these findings, if after two years of receiving federal funding coordinators report that only two of thirty components have reached the initial implementation stage, it seems unlikely that all or even the "essential elements" will have reached that stage in three years. This finding calls into question the wisdom of limiting external financial support to a three-year time frame; it also raises concerns about how much time and funding is sensible and appropriate for institutionalization of Tech Prep at the local level.

[8] Within the federal Title IIIE, Tech Prep Education Act, the following appears: "Three-year plan.—Each application submitted under this section shall contain a 3-year plan for the development and implementation of activities under this plan" (American Vocational Association, 1990, p. 100). In Layton and Bragg (1992) we reported that state Tech Prep coordinators frequently indicated that three-year plans were being prescribed by their states for local consortia receiving Title IIIE Tech Prep Act funds.

Table 11

Stage of Implementation of Tech Prep Components by Initial Funding Year

	1991 (n=262)		1992 (n=130)	
Tech Prep Component	Mean	SD	Mean	SD
Consortium building	4.22	.81	3.87	1.05
Formal signed articulation agreements	4.15	1.06	3.73	1.20
Joint inservice of secondary & postsecondary personnel	3.95	1.02	3.52	1.05
Team building to facilitate planning & implementation	3.88	.92	3.62	1.01
Equal access for all students	3.87	1.08	3.24	1.22
Development of 2+2 core academic & technical curriculum	3.76	1.01	3.30	1.13
Site-based planning & decision making	3.65	1.04	3.34	1.10
Long-range &/or strategic planning	3.61	1.03	3.35	1.07
Marketing & promotions	3.62	1.11	3.08	1.21
Inservice for counselors	3.61	1.02	3.05	1.13
Integration of secondary academic & vocational curriculum	3.42	.95	3.05	1.12
Collaboration between academic & vocational educators	3.37	1.08	3.11	1.14
Career awareness & exploration for students	3.45	1.14	2.81	1.14
Guidance & counseling services	3.39	1.05	2.88	1.15
Labor market analysis to inform curriculum development	3.36	1.32	2.86	1.34
Use of new instructional strategies	3.29	1.09	2.96	1.20
Formal partnerships with business & industry	3.28	1.17	2.97	1.06
Strategies to address the needs of special populations	3.32	1.13	2.84	1.12
Preparatory services for all participants	3.30	1.17	2.82	1.10
Workplace prof. development for teachers & counselors	3.16	1.30	2.62	1.24
Use of outcomes-based education	3.13	1.19	2.54	1.12
Evaluation of Tech Prep programs	3.05	1.18	2.59	1.13
Joint planning time for academic & vocational teachers	2.87	1.24	2.67	1.25
Alternative assessments	2.86	1.20	2.54	1.24
Integration of postsec. academic & vocational curriculum	2.81	1.23	2.55	1.24
Development of advanced skills curriculum	2.87	1.28	2.39	1.21
Work-based learning for students	2.81	1.23	2.35	1.12
Job placement services for students & graduates	2.63	1.46	2.29	1.33
Computer monitoring of student progress	2.23	1.24	1.90	1.06
Apprenticeships spanning secondary & postsecondary ed.	2.09	1.14	1.87	.93

Barriers to Tech Prep Implementation

Barriers to the implementation of Tech Prep were also a focus of this study. Respondents were presented with fifty barriers and asked to rate the level of impact of each according to the following scale: 1 = none, 2 = very minor, 3 = minor, 4 = moderate, 5 = major, and 6 = very major. The list of fifty barriers presented in the questionnaire was gleaned from the literature and from our observations in conducting previous field research. They were wide ranging, covering obstacles linked to attitudes, resources, expertise, policy, practices, and so forth. Overall, the vast majority of barriers had minor or moderate levels of impact on Tech Prep implementation. Only ten of the fifty barriers had a mean score of 3.7 or higher, and of these, only four were considered to have a major level of impact evidenced by a mean rating of over 4.0. (Descriptive statistics for the fifty barriers appears in Table 12.)

Of all fifty barriers, the barrier of little time designated for joint planning by academic and vocational or secondary and postsecondary faculty was perceived to be the most serious by respondents as indicated by a mean score of 4.21 on the six-point scale. This barrier was given a major or very major rating by 44% of the respondents. This barrier may indicate that faculty, upon whom a large share of the responsibility for the actual implementation of Tech Prep often rests, do not have sufficient time to work together to accomplish the planning and development work necessary for Tech Prep, although other competing explanations may be presented such as the possibility that these faculty groups do not want to collaborate.

Three other barriers were rated similarly to this first one, and all three were seen by respondents as having a moderate impact on Tech Prep implementation, as indicated by a mean score of approximately 4.0. These three barriers were (1) failure of four-year colleges and universities to award college credit for applied academic or other Tech Prep courses; (2) lack of general awareness about Tech Prep; and (3) lack of staff, time, and money.

Table 12

Ratings of Barriers to Local Tech Prep Implementation

Barrier	Level of Impact: None	Very Minor	Minor	Moderate	Major	Very Major	Mean	SD
Little time for joint planning by vocational and academic or secondary and postsecondary faculty	2.8%	6.4%	17.6%	28.8%	28.6%	15.8%	4.21	1.25
Failure of four-year colleges and universities to award college credit for applied academic or other Tech Prep courses	10.3%	9.3%	12.2%	20.1%	25.9%	22.2%	4.09	1.60
Lack of general awareness about Tech Prep	1.5%	6.6%	18.9%	38.1%	27.0%	7.8%	4.06	1.08
Lack of staff, time, and money dedicated to Tech Prep	2.5%	7.3%	18.9%	34.8%	27.0%	9.3%	4.05	1.16
Difficulty in dealing with educational bureaucracies	4.3%	9.5%	23.3%	34.5%	17.6%	10.7%	3.84	1.26
Belief that Tech Prep is an educational "fad" that will go away	4.3%	10.6%	21.5%	33.2%	21.0%	9.4%	3.84	1.26
Negative attitude toward vocational education	2.5%	9.2%	24.7%	40.2%	17.6%	5.9%	3.79	1.10
Lack of knowledge and skills among education personnel in how to implement educational change	3.6%	10.5%	23.7%	37.2%	19.9%	5.1%	3.75	1.15
Looking at Tech Prep as vocational education by another name	4.1%	11.5%	24.9%	33.6%	19.8%	6.1%	3.72	1.20
Resistance from academic educators to make changes for Tech Prep	2.3%	14.5%	25.4%	31.7%	21.3%	4.8%	3.70	1.16
Failure of educators to see the need to change	3.8%	13.4%	25.8%	32.2%	19.2%	5.6%	3.66	1.20
Lack of funds for curriculum reform	9.6%	13.9%	20.5%	27.8%	18.7%	9.4%	3.60	1.43
Pressure for quick success and student head counts	16.0%	12.2%	16.5%	25.7%	17.3%	12.2%	3.53	1.59
Lack of counselor interest in or involvement with Tech Prep	10.3%	16.4%	19.7%	27.9%	17.4%	8.2%	3.51	1.43
Lack of collaboration between vocational and academic educators	3.6%	15.8%	29.8%	33.6%	13.2%	4.1%	3.49	1.14
Inability of young people to make early career decisions	8.0%	18.9%	21.2%	30.2%	17.3%	4.4%	3.43	1.31
Limitations in using Tech Prep funds for equipment or instructional materials purchases	11.5%	18.4%	21.0%	22.8%	17.4%	9.0%	3.43	1.48
Lack of clear *state*-level policy for Tech Prep	12.1%	21.2%	18.7%	22.5%	14.6%	10.9%	3.39	1.53
Lack of jobs in the region for Tech Prep graduates	13.7%	17.3%	20.1%	25.2%	14.2%	9.4%	3.37	1.50
Lack of evaluation mechanisms to inform implementation	10.6%	17.9%	26.9%	27.5%	13.7%	3.4%	3.26	1.29
Funding for Tech Prep limited to vocational education sources	20.3%	15.2%	17.5%	22.8%	14.5%	9.6%	3.25	1.61
Lack of authority of local personnel to make changes needed to implement Tech Prep	12.7%	19.8%	25.4%	22.3%	12.2%	7.6%	3.24	1.43
Resistance from secondary schools to introduce Tech Prep into the curriculum	9.7%	20.2%	27.6%	30.4%	9.9%	2.3%	3.18	1.21

Table 12 (cont.)

Barrier	Level of Impact: None	Very Minor	Minor	Moderate	Major	Very Major	Mean	SD
Turf battles between secondary and postsecondary educators	9.8%	20.2%	33.3%	22.7%	9.8%	4.0%	3.15	1.25
Lack of clear *local*-level policy for Tech Prep	13.2%	23.2%	22.6%	24.9%	9.7%	6.4%	3.14	1.40
Lack of clear *federal*-level policy for Tech Prep	14.0%	21.1%	26.4%	20.3%	11.9%	6.3%	3.14	1.42
Difficulty maintaining momentum over the long term	16.4%	16.9%	27.9%	21.5%	13.1%	4.1%	3.10	1.39
Resistance from postsecondary schools to introduce Tech Prep into the curriculum	15.4%	20.0%	26.7%	26.4%	8.2%	3.3%	3.02	1.31
Resistance from vocational educators to make changes for Tech Prep	9.7%	23.6%	34.6%	21.3%	9.0%	1.8%	3.02	1.17
Limitations in using Tech Prep funds beyond grades 11-14	24.4%	20.3%	18.5%	13.9%	14.7%	8.2%	2.99	1.63
Lack of parental support for Tech Prep	16.3%	20.7%	29.0%	23.1%	8.8%	2.1%	2.94	1.28
Difficulty reaching consensus among curriculum planners on reform strategies	12.3%	27.2%	29.3%	20.6%	8.7%	1.8%	2.92	1.22
Resistance from secondary school administrators to Tech Prep	15.7%	23.6%	26.9%	23.1%	8.4%	2.3%	2.92	1.28
Lack of support from *both* state secondary and postsecondary agencies	17.8%	23.7%	28.2%	17.8%	6.6%	5.9%	2.89	1.38
Lack of availability of integrated vocational and academic curriculum materials	14.5%	25.7%	29.3%	20.9%	7.9%	1.8%	2.87	1.23
Lack of student interest in Tech Prep	15.5%	23.8%	30.3%	22.5%	6.2%	1.6%	2.85	1.21
Failure to employ local Tech Prep coordinator full-time	42.2%	7.2%	12.3%	13.8%	13.3%	11.3%	2.83	1.85
Lack of credibility of vocational educators involved with Tech Prep	11.9%	29.9%	30.7%	21.1%	4.1%	2.3%	2.82	1.15
Lack of experts to provide inservice about Tech Prep	22.0%	21.5%	27.1%	18.7%	8.2%	2.6%	2.77	1.34
Conflict with other educational reform movements	22.0%	26.3%	24.6%	17.0%	6.1%	4.1%	2.71	1.36
Difficulty in developing formal articulation agreements between secondary and postsecondary schools	22.2%	26.3%	21.7%	22.4%	5.6%	1.8%	2.68	1.29
Lack of active involvement from business and industry	22.6%	26.4%	24.4%	16.8%	7.6%	2.3%	2.67	1.32
Turnover of local or state leaders involved in Tech Prep	25.5%	28.1%	21.2%	12.8%	7.7%	4.8%	2.64	1.43
Resistance from postsecondary school administrators to Tech Prep	25.3%	25.3%	27.1%	14.8%	5.1%	2.3%	2.56	1.28
Lack of support from business and industry	24.2%	28.8%	29.6%	13.0%	3.3%	1.0%	2.45	1.15
Failure of two-year postsecondary schools to accommodate Tech Prep students	29.2%	31.3%	21.4%	12.7%	4.7%	0.8%	2.35	1.20
Lack of support from labor organizations	36.7%	23.8%	22.1%	9.1%	4.4%	3.9%	2.32	1.37
Too much flexibility in local implementation of Tech Prep	30.4%	29.9%	24.3%	10.0%	4.3%	1.0%	2.31	1.19
Pressure from special interest groups to modify Tech Prep	42.9%	27.3%	17.6%	6.9%	3.1%	2.3%	2.07	1.23
Lack of cooperation from teachers' unions	47.4%	20.7%	17.7%	8.7%	4.4%	1.1%	2.05	1.25

Failure of four-year colleges to award credit for Tech Prep courses was given a major or very major rating by 48% of the respondents, indicating its perceived negative impact on Tech Prep implementation. Other findings in this report indicate that Tech Prep has focused on articulation between the secondary and two-year postsecondary levels; however, the link with four-year postsecondary education has not been forged, as was advocated by the federal Tech Prep Education Act. It seems educational policy and curriculum issues need to be addressed if Tech Prep curriculum is to be linked to four-year postsecondary education in systematic and meaningful ways. The barrier of a lack of general awareness represents a similar concern about linkages, but with other audiences. Recall from the previous discussion of implementation of Tech Prep components that marketing and promotion was rated at the development stage of implementation. As a result, the public may not be aware of Tech Prep, and this may be problematic as the initiative attempts to move forward and expand.

Apparently the lack of resources of all types, certainly the lack of staff, time, and money, was another difficulty being experienced by local consortia. Nearly 35% of coordinators identified a lack of resources as a major or very major barrier. Other findings from the study bolster the importance of this barrier. For example, only 37% of respondents were funded full-time as Tech Prep coordinators, with the rest being part-time or having the position added on to other pre-existing duties. At the same time, 57% of the respondents reported spending up to thirty hours a week on Tech Prep activities; the overall average was twenty-eight hours per week. Looking only at the local leadership of consortia, it is apparent that resources were perceived to be stretched very thin.

The belief that Tech Prep is an educational fad that will go away was given a mean rating of 3.84, along with the barrier of difficulty in dealing with educational bureaucracies. Such a high rating may indicate that Tech Prep is not being taken seriously and that this perception may have impeded implementation efforts. In regard to difficulty in dealing with educational bureaucracies, this barrier points to the issues Tech Prep may face as an educational reform within and across those institutions that join together as a local consortium. In addition, this barrier may be indicative of other obstacles that extend throughout the educational system (i.e., elementary, secondary, and postsecondary) and at the local, state, and federal levels. It is a barrier that is repeatedly identified in the educational reform literature and associated with problems in making systemic educational reform successful (Fullan, 1991).

The next four barriers in Table 12 appeared to address similar ideas. These were (1) negative attitude toward vocational education, (2) looking at Tech Prep as vocational education by another name, (3) resistance from academic educators to making changes for Tech Prep, and (4) lack of knowledge and skills among personnel in how to implement educational change. Approximately 25% of the respondents gave these barriers a major or very major rating. If vocational education is seen in a negative light, and Tech Prep is viewed as part of vocational education, then Tech Prep will certainly be affected by these perceptions. This difficulty can be seen as a barrier to any reform based on vocational education, but Tech Prep, because of its scope and ambition, may have more to overcome in this area. The barrier of a lack of knowledge and skills to implement change may represent a measure of the knowledge, self-confidence, and ability of the practitioners who are expected to implement Tech Prep to actually do so. Finally, the barrier of resistance from academic educators to make changes for Tech Prep may be indicative of problems with eliciting commitment from academic faculty. Of course, resistance from academic educators may be related to other barriers such as negative perceptions of vocational education and Tech Prep's connection with it.

The mean ratings of nineteen other barriers fell between 3.0 and 4.0, indicating that they were seen as having a minor to moderate level of impact on the implementation of Tech Prep at the local consortium level. These barriers were wide-ranging, but tended to focus on policy issues, funding problems, relationships between vocational and academic and secondary and postsecondary educators, and resistance to Tech Prep reforms from various stakeholder groups. Based on their mean score rating of 2.9 or below, the remaining twenty-one barriers were rated as having a very minor to minor impact on implementation. While the ratings of these barriers were all relatively low compared to the other twenty-nine barriers, it is worth noting that none of the barriers were seen as having "no impact whatsoever" on the progress of Tech Prep. Overall, these barriers were indicative of concerns with local conditions and issues, stakeholder attitudes and involvement, administrative resistance, and lack of resources such as instructional materials and professional development experts.

Barriers by First Year of Tech Prep Funding

Further analysis of the fifty barriers was conducted to determine whether there were differences in the ratings of barriers based on the year local consortia first received federal Tech Prep funds. In looking at the rating according to the first year consortia were funded,

either 1991 or 1992, a relatively consistent pattern of responses was evident. (The ratings of the barriers by these two groups and related descriptive statistics appear in Table 13.) Overall, most of the barriers were given a somewhat higher rating by those in their second year of funding than by those in the first year. Certainly there are many potential explanations for this phenomenon including the possibility that having an additional year of funding heightened an awareness of many of these barriers. However, further analysis is required to explain with any certainty the relationships that exist between the year first funded and barriers to implementation.

Based on a two-tailed *t*-test, eleven of the fifty barriers were statistically significant at a .05 level. These were a (1) negative attitude towards vocational education; (2) the failure of educators to see the need for change; (3) limitations in using Tech Prep funds beyond grades 11-14; (4) a lack of evaluation mechanisms; (5) a lack of authority of local personnel to make changes needed for Tech Prep; (6) pressure from special interest groups; (7) lack of parental support; (8) student interest; and (9) counselor involvement; (10) looking at Tech Prep as vocational education by another name; and (11) the failure of four-year colleges and universities to award credit for applied academic and other Tech Prep courses. Interestingly, two of the fifty barriers were rated higher by the consortia funded for one year than those funded for two years at a statistically significant level. These two barriers were (1) resistance from postsecondary administrators to Tech Prep and (2) a lack of experts to provide inservice for Tech Prep. An obvious implication of these findings is that with the gaining of experience with Tech Prep (at least an additional year of experience), the negative impact of these two barriers lessens.

Table 13

Ratings of Barriers to Tech Prep Implementation by Year Funded

Barrier	1991 (n=262) Mean	1991 (n=262) SD	1992 (n=130) Mean	1992 (n=130) SD
Little time for joint planning by vocational and academic or secondary and postsecondary faculty	4.29	1.20	4.10	1.32
Failure of four-year colleges and universities to award college credit for applied academic or other Tech Prep courses	4.22	1.50	3.87	1.75
Lack of general awareness about Tech Prep	4.06	1.06	4.06	1.11
Lack of staff, time, and money dedicated to Tech Prep	4.12	1.17	3.91	1.15
Difficulty in dealing with educational bureaucracies	3.90	1.25	3.73	1.25
Belief that Tech Prep is an educational "fad" that will go away	3.91	1.22	3.71	1.33
Negative attitude toward vocational education	3.92	1.07	3.52	1.09
Lack of knowledge and skills among education personnel in how to implement educational change	3.77	1.12	3.75	1.20
Looking at Tech Prep as vocational education by another name	3.83	1.16	3.52	1.23
Resistance from academic educators to make changes for Tech Prep	3.76	1.15	3.58	1.20
Failure of educators to see the need to change	3.75	1.18	3.49	1.22
Lack of funds for curriculum reform	3.69	1.42	3.45	1.45
Pressure for quick success and student head counts	3.61	1.60	3.37	1.58
Lack of counselor interest in or involvement with Tech Prep	3.62	1.37	3.28	1.51
Lack of collaboration between vocational and academic educators	3.52	1.10	3.47	1.20
Inability of young people to make early career decisions	3.51	1.22	3.28	1.46
Limitations in using Tech Prep funds for equipment or instructional materials purchases	3.50	1.44	3.28	1.56
Lack of clear *state*-level policy for Tech Prep	3.48	1.52	3.20	1.51
Lack of jobs in the region for Tech Prep graduates	3.41	1.50	3.33	1.51
Lack of evaluation mechanisms to inform implementation	3.42	1.25	2.94	1.32
Funding for Tech Prep limited to vocational education sources	3.32	1.61	3.14	1.59
Lack of authority of local personnel to make changes needed to implement Tech Prep	3.36	1.37	3.04	1.54
Resistance from secondary schools to introduce Tech Prep into the curriculum	3.19	1.23	3.16	1.19

Table 13 (cont.)

Barrier	1991 (n=262) Mean	1991 (n=262) SD	1992 (n=130) Mean	1992 (n=130) SD
Turf battles between secondary and postsecondary educators	3.15	1.26	3.17	1.24
Lack of clear *local*-level policy for Tech Prep	3.18	1.39	3.03	1.40
Lack of clear *federal*-level policy for Tech Prep	3.20	1.39	3.03	1.46
Difficulty maintaining momentum over the long term	3.13	1.38	3.06	1.43
Resistance from postsecondary schools to introduce Tech Prep into the curriculum	2.95	1.28	3.13	1.35
Resistance from vocational educators to make changes for Tech Prep	3.07	1.13	2.93	1.25
Limitations in using Tech Prep funds beyond grades 11-14	3.11	1.66	2.74	1.54
Lack of parental support for Tech Prep	3.07	1.23	2.69	1.33
Difficulty reaching consensus among curriculum planners on reform strategies	2.91	1.22	2.92	1.22
Resistance from secondary school administrators to Tech Prep	2.90	1.25	2.95	1.31
Lack of support from *both* state secondary and postsecondary agencies	2.93	1.39	2.80	1.35
Lack of availability of integrated vocational and academic curriculum materials	2.92	1.21	2.80	1.25
Lack of student interest in Tech Prep	2.99	1.19	2.55	1.19
Failure to employ local Tech Prep coordinator full-time	2.79	1.84	2.91	1.90
Lack of credibility of vocational educators involved with Tech Prep	2.85	1.10	2.74	1.22
Lack of experts to provide inservice about Tech Prep	2.67	1.29	2.99	1.41
Conflict with other educational reform movements	2.69	1.38	2.76	1.32
Difficulty in developing formal articulation agreements between secondary and postsecondary schools	2.66	1.27	2.72	1.32
Lack of active involvement from business and industry	2.73	1.31	2.57	1.35
Turnover of local or state leaders involved in Tech Prep	2.63	1.42	2.63	1.44
Resistance from postsecondary school administrators to Tech Prep	2.47	1.28	2.77	1.26
Lack of support from business and industry	2.49	1.13	2.38	1.19
Failure of two-year postsecondary schools to accommodate Tech Prep students	2.33	1.14	2.36	1.28
Lack of support from labor organizations	2.36	1.38	2.27	1.35
Too much flexibility in local implementation of Tech Prep	2.36	1.20	2.20	1.10
Pressure from special interest groups to modify Tech Prep	2.17	1.26	1.87	1.17
Lack of cooperation from teachers' unions	2.12	1.29	1.91	1.17

Factor Analysis of Barriers to Tech Prep Implementation

The fifty barriers were subjected to a factor analysis to identify latent variables in the perceived barriers to Tech Prep implementation. Factor analysis often yields the maximum amount of information from the original variables in fewer derived variables, called common factors, that reduce the dataset and enhance interpretability (Gorsuch, 1983). Data from the barriers subscale was analyzed using principal axis factor (PAF) extraction with varimax rotation. Factor analysis solutions were carried out with other procedures including the computation of oblique solutions; however, these solutions were deemed much less useful in identifying the latent variables in the barriers subscale than with the PAF extraction.

Using the PAF procedure, five common factors were extracted and all were interpretable. Together, the five factors accounted for 45.9% of the total variance (see Table 14). Only 2.7% of the residual elements in the reproduced correlation matrix were larger than .10, indicating that the five factor solution fit the data well. The following discussion focuses on one possible interpretation of the latent variables underlying the barrier subscale. The factor loadings are correlations between each barrier and the common factors. A high loading represents a strong relation between the barrier and a factor. All factor loadings above .40 are considered high enough to aid in interpreting the factors in this study. (These factor loadings are noted in Table 14 in boldface type.)

Table 14

PAF (Varimax Rotation) Factor Matrix Showing Factor Loadings, Reliabilities, and Summary Statistics for Barriers to Implementation of Tech Prep (TP)

	Factor Loadings				
Item	I	II	III	IV	V
Resistance from academic educators	**.68**	.13	.13	.19	.14
Belief that TP is a fad	**.66**	.19	.12	.08	.16
Negative attitude toward vocational education	**.65**	.08	.01	.08	.11
Looking at TP as vocational education	**.65**	.21	.07	.11	.16
Failure of educators to change	**.63**	.12	.06	.05	.20
Lack of general awareness about TP	**.58**	.08	.16	.11	.05
Lack of collaboration between vocational and academic educators	**.58**	.03	.22	.31	.20
Resistance from secondary schools to introduce TP	**.55**	.30	.22	.02	.31
Difficulty in dealing with educational bureaucracies	**.55**	.32	.10	.12	.17
Resistance from secondary school administrators to Tech Prep	**.51**	.32	.15	-.07	.24
Lack of knowledge and skills among education personnel to change	**.48**	.06	.21	.30	.21
Lack of counselor interest in TP	**.45**	.16	.38	.07	.09
Resistance from vocational educators	**.40**	.15	.22	.08	.26
Lack of clear state-level policy for TP	.20	**.77**	.02	.16	-.06
Lack of clear federal-level policy for TP	.17	**.65**	.01	.33	.05
Lack of support from sec. and postsec.	.20	**.61**	.16	.17	.09
Turnover of local or state leaders of TP	.09	**.58**	.13	.15	.10
Lack of clear local level policy for TP	.28	**.55**	.09	.26	.23
Too much flexibility in implementing TP	.13	**.54**	.19	.15	.10
Lack of student interest in Tech Prep	.31	.09	**.73**	.03	.00
Lack of parental support for Tech Prep	.30	.16	**.67**	.09	-.03
Inability of young people to make early career decisions	.18	.08	**.65**	.09	-.08
Lack of jobs in the region for TP graduates	.01	.03	**.50**	.20	.09
Lack of involvement from business/industry	.06	.20	**.48**	.09	.16

Table 14 (cont.)

Item	Factor Loadings I	II	III	IV	V
Lack of support from business/industry	.05	.22	**.41**	.10	.35
Lack of support from labor organizations	-.08	.20	**.40**	.07	.34
Lack of funds for curriculum reform	.14	.11	.02	**.64**	.19
Funding for TP is limited to voc. ed.	.13	.23	.12	**.56**	-.00
Limitations in using Tech Prep funds	-.00	.26	.09	**.54**	-.04
Little time for joint planning by faculty	**.44**	.03	.18	**.49**	.18
Lack of staff, time, and money for TP	.27	.13	-.13	**.47**	.11
Failure to employ TP coordinator full-time	.02	.06	.10	**.42**	.03
Resistance from postsec. schools to TP	.25	.21	.12	-.09	**.67**
Resistance from postsec. admin. to TP	.29	.17	-.03	.04	**.63**
Failure of postsec. schools to accommodate TP students	.22	.09	.07	.11	**.56**
Difficulty in developing formal articulation agreements	.32	-.01	.11	.20	**.52**
Turf battles between secondary and postsecondary educators	.32	-.01	-.05	.06	**.52**
Difficulty reaching consensus among curriculum planners on reform strategies	.32	.21	.17	.19	**.42**
Eigenvalues	13.54	2.98	2.43	2.05	1.95
Percent of Variance	27.1	6.0	4.9	4.1	3.9
Alpha coefficient	.90	.83	.81	.73	.81

Note: Factor loadings in boldface type are above .40 and considered high enough to aid in interpretation of factors.

The first factor is resistance to Tech Prep. Fourteen of the fifty items in the barriers subscale appear in this first factor. It is characterized by resistance to Tech Prep from several groups: academic educators, vocational educators, administrators, and counselors. Barriers associated with this factor are concentrated primarily at the secondary level. Problems inherent in getting vocational and academic educators to collaborate and the failure of educators to change are also compared within this factor, with the problem of negative attitudes toward vocational education and the fleeting image of Tech Prep adding to the concept. Finally, this factor portrays Tech Prep as a concept that may have difficulty rallying support from some of the stakeholder groups often solicited to assist in implementing it.

The second factor is lack of clear policy. It is characterized by the sense of failure to define local, state, or federal Tech Prep policy in ways that practitioners can understand it. Also contained in this factor are the items of turnover of local or state leaders and too much flexibility in implementation. This latent factor seems to provide an image of a vague and possibly unsynchronized policy from the top levels on down.

The lack of support from external stakeholders makes up the third factor. This factor indicates resistance to Tech Prep from several groups: students, parents, and employers. Evident in this factor is a lack of interest among students and parents in Tech Prep and the inability of young people to make career decisions. The complex relationship between the educational aspirations of students and their parents along with the needs of business, industry, and labor are apparent in this factor as well. Without the support of these potentially contentious groups, it appears Tech Prep may have difficulty getting fully implemented.

The fourth factor is lack of resources. It can be seen as an expression of a hunger for resources that are generally understood to be required for implementation, especially funds, people, and time. These findings indicate these resources were either not available in satisfactory amounts or were limited in the ways they could be used. The factor indicates difficulties with local practitioners who attempt to implement Tech Prep without the proper tools.

The fifth factor is lack of cooperation from postsecondary educators. This factor focuses on problems with the postsecondary level (primarily two-year postsecondary schools) engaging in the implementation of Tech Prep. Postsecondary administrators and teachers alike apparently resist efforts to introduce Tech Prep into their institutions, to make necessary changes for new students and programs, and to cooperate with colleagues at the secondary level. Curriculum and articulation agreements are specifically named as impacted by this factor.

In summary, based on a PAF with varimax rotation, we were able to identify five factors: (1) resistance to Tech Prep, (2) lack of clear policy, (3) lack of support from external stakeholders, (4) lack of resources, and (5) lack of cooperation from postsecondary educators. These five factors help to illustrate the complexity of Tech Prep implementation and the many obstacles to local implementation. Future efforts to examine

the complexities in these relationships should include testing theories about barriers, using statistical analysis procedures such as structural equation modeling. By carrying out these types of procedures, researchers can obtain a better understanding of how local Tech Prep implementation is influenced by specific barriers, creating more opportunity to devise and test alternative implementation strategies.

Local Coordinator Recommendations for Federal and State Policy

Respondents were asked to provide recommendations for improving state and federal policy in an open-ended question format. Recommendations were received from 288 respondents who provided a wide range of suggestions. Similar to the analysis procedures used elsewhere for this study, common themes were identified by project staff. A list of the top ten recommendations for state and federal policy is discussed in this section of the report. In many cases, the parallels between local coordinator recommendations and perceptions about barriers to Tech Prep were readily apparent.

The most predominant of all suggestions were those focusing on extending Tech Prep into grades lower than eleven. These kinds of recommendations were made by 53 respondents. Local coordinators anticipated problems offering a more rigorous technical and academic curriculum in the 11th and 12th grades if students were not given adequate coursework in the 9th and 10th grades, especially in the academic subjects of math and science. One coordinator put it concisely, "You can't jump start academics at the 11th grade." In addition, coordinators spoke of the importance of working with the elementary, middle, and junior high school levels to give students better educational and career preparation. Some coordinators even suggested that "Tech Prep should be started in kindergarten." Typical of the recommendations by Tech Prep coordinators was the following comment: "Tech Prep is not just for grades 11-14. Tech Prep is a concept of educational preparation involving grades 9-14 and sometimes higher. Students should be prepared for the concept in grades 6-8 and Tech Prep monies should be utilized at those grade levels also."

A second area of recommendations made by 30 local coordinators involved the need for more money for the Tech Prep effort, thereby reinforcing the importance of overcoming a top ranked barrier of too little staff, time, and *money* for Tech Prep. One coordinator put

the request quite simply: "More money! More money! More money! Need I say more?" The suggestions of respondents focused on the need for more fiscal resources to accomplish several tasks such as to fund coordinator positions full time; to carry out summer teacher training, middle school curriculum, and counselor activities; to purchase equipment; and so forth. One coordinator worded the request this way, "[We need] more $ for implementation. $50,000 does not begin to meet the needs for implementation of Tech Prep, especially when [there are] needs for purchasing state-of-the-art equipment to replace antiquated equipment."

In a closely related area of recommendations, twenty-five of the local coordinators suggested more flexibility in using funds and in implementing state and federal policies. Requests for flexibility were applied to many different aspects of Tech Prep programming with coordinators' recommendations being sometimes contradictory. For example, some coordinators suggested Tech Prep be applied more generally as an educational reform for all students; others recommended that funds and policy be targeted to certain student populations. The following two recommendations typify these sorts of recommendations: "[We] need more flexibility to use Tech Prep as educational reform, rather than being restricted to specific programs for a lesser number of students" versus "Eliminate [the] general track and mandate Tech Prep as one of three educational paths: College Prep, Tech Prep, and Vocational Prep." Related to the need for flexibility, some coordinators pointed out problems with state-level policies they believed to be overly restrictive, creating difficulties in meeting local needs. For example, one coordinator suggested, "Be sure to permit adequate flexibility at [the] local level to adapt to particular strengths and characteristics of the area." Another said, "Flexibility is important. Each consortium has different needs and strengths. The flexibility increases output because funding can be used where other sources restrict. Thus, Tech Prep benefits by filling in where other sources stopped." A few coordinators also recommended less paperwork to ensure their time is spent on managerial activities that directly result in implementation of Tech Prep.

Ideas for promoting Tech Prep at the highest local, state, and federal levels were made by 15 coordinators. Typical of these recommendations were the following comments: "National, state, and local leadership needs to be more vocal and visible about the resources allocated and the outcomes expected from this initiative. If a long-range plan exists, it should be communicated to lay citizens." In addition, several local coordinators were especially critical of the lack of attention paid to Tech Prep by top ranking federal

officials. One coordinator put the issue this way, "Although perhaps not a policy concern, Washington does too little to promote Tech Prep. George Bush never used the term. Bill Clinton has occasionally voiced the term, and present DOE [U.S. Department of Education] and DOL [U.S. Department of Labor] leaders constantly talk about youth apprenticeship, school-to-work this and that, etc. No wonder we're having trouble making the public aware of Tech Prep. We can't get any press!" Another coordinator stated, "Federal and state policies need to be sustained over time . . . Yet federal and state policy makers seem to be flocking to the idea of 'Youth Apprenticeships,' to the potential exclusion of Tech Prep. We see Tech Prep and Youth Apprenticeship as entirely compatible. Both should be encouraged in a coordinated fashion." Imbedded in these latter two statements is the issue of the priority and compatibility of existing and pending legislation on school-to-work and Tech Prep. As new school-to-work legislation moves forward in Congress, it is crucial that policymakers at all levels send a message of how these policies fit together, or otherwise face the risk of resources wasted in changing direction.

Fifteen respondents made recommendations related to mandating Tech Prep at the state level as has been done at the federal level. By mandating the Tech Prep approach, these coordinators believed it would be taken more seriously and a smoother path to local implementation could be forged. Indicative of these recommendations was the following suggestion: "Tech Prep must be a national directive *and* a state mandated educational reform to be taken seriously. As a long term change agent, Tech Prep is not regarded as state supported by the community colleges."

Another area of suggestions voiced by 15 respondents was to authorize support for Tech Prep for a longer period of time than the three years mentioned in federal legislation. Representative of this recommendation was the comment of one coordinator that "[T]o get valid results . . . Tech Prep federal and state legislation should be extended. We want great results fast. Change takes time, even moving at a fast pace." Another coordinator pointed out, "Reform will take five to ten years to institutionalize in high school classrooms. Both federal and state level people must understand that Tech Prep is educational reform and [they] need to fund this reform movement until *it is institutionalized —A three year shot will not do it!!!!*" (emphasis theirs).

Fourteen coordinators made recommendations about ensuring that federal policy provide a clearer definition and more consistent goals for Tech Prep. Indicative of this

recommendation was the following comment: "There appears to be a conflict of ideas dealing with the implementation of Tech Prep. Federal policy addresses raising the technical level of our work force. We are faced with providing full access to all students. We need a clearer goal and a firm commitment from the Congress on exactly what they are providing these funds for. Tech Prep is too good a concept to remain in a mediocre state." In addition, a few coordinators voiced concern about the different patterns of Tech Prep they saw evolving in different states and localities and how these variations could affect the success of Tech Prep implementation overall. One coordinator said, "We need a more consistent policy from state-to-state from the federal level. Some states can do things others won't."

An additional area of recommendations reinforced the importance of coordination of Tech Prep with other educational reforms, throughout the local, state, and federal levels. Typical of this recommendation was the following comment made by a coordinator:

> Tech Prep is a holistic K-14 (and beyond) reform, transformational in scope. We need the support of the Clinton Administration. Someone should explain that apprenticeships are terrific, but can easily be incorporated into the bigger umbrella called Tech Prep. Career paths must begin no later than ninth grade. There continues to be the notion that Tech Prep is a 'program,' i.e. only curriculum, rather than a 'system' which includes professional development, site-based management, counseling/ assessment, information dissemination, etc. The new law should emphasize all components *CLEARLY* (emphasis theirs).

Facilitating college credit for Tech Prep courses and increasing four-year school involvement was an area of recommendations made by 12 coordinators. Similarly to the recommendations regarding funding, this recommendation addressed a top-ranked barrier discussed previously in this study, that is, the failure of four-year colleges and universities to award college credit for applied academic or other Tech Prep courses. A coordinator made the following comment regarding this issue: "If the four-year universities will not recognize Tech Prep classes, Tech Prep will be a 'fad.'" Another coordinator suggested the following to help remedy the gap between ideas for Tech Prep reform and university requirements: "Obtain university acceptance of technical academic courses. Tech Prep, if it continues to push these courses, will alienate a large segment of the secondary academic community since these courses do not meet university entrance requirements. Perhaps revision and/or augmentation of existing courses would be better emphasized!"

The last area of recommendations, made by twelve respondents, is to ensure better evaluation, more accountability, and higher standards for Tech Prep programs. These suggestions address a component of Tech Prep that is clearly neglected by implementation efforts carried out by the vast majority of local consortia evaluations. Indicative of this area of recommendations is the following coordinator comment:

> Guidelines are generally nebulous. Accountability is very vague. Consortia 'count' one way to fulfill grant objectives, while the state later wants different kinds of numbers and the federal [people] come along and require altogether different counts. Our information systems personnel don't have abundant time and personnel to readily produce the counts we need to document.

Other recommendations regarding evaluation portray local frustration with the lack of clear direction for evaluation from the state and federal levels. One coordinator suggested, "Provide clear feedback as to the details of program evaluations, e.g. what they will involve, what programs should be doing to get ready and stay ready, etc." This recommendation, and those made by other coordinators, recognizes that evaluation will eventually play a role in Tech Prep, and these coordinators are suggesting a more clearly laid plan for it now.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This study examined Tech Prep implementation in the United States. The primary purpose of the study was to describe the goals and actions undertaken by local consortia to implement Tech Prep. Five research questions guided the study:

1. What are the characteristics of Tech Prep local consortia and their coordinators?
2. What are the goals, elements, and outcomes of local Tech Prep initiatives?
3. At what stage of implementation are local Tech Prep initiatives and the selected Tech Prep components operating within these initiatives?
4. What barriers are perceived to impact local Tech Prep implementation?
5. What do local coordinators perceive to be needed changes in state and federal policy?

These five questions provided the basis for the development of a 16-page questionnaire mailed to a sample of local Tech Prep consortium coordinators. Of all 473 in the sample, 397 coordinators ultimately responded, yielding a response rate of 84%. Data was tabulated, analyzed, and reported to create a comprehensive picture of local Tech Prep implementation. These findings help to explain what has happened with Tech Prep on a nationwide basis through the first two years of federal support. Our intention in conducting this research was to address important yet unanswered questions. This study has helped to paint a picture of what Tech Prep is about from the perspective of those closest to it: local Tech Prep coordinators.

Rapid growth has characterized Tech Prep activity following passage of the federal Tech Prep Education Act and the distribution of federal funds beginning in July of 1991. Prior to that time, only 18% of secondary schools in the United States indicated involvement in Tech Prep (U.S. General Accounting Office, 1993). Now, arguably as many as 50% of secondary schools have engaged in local Tech Prep consortium activities and an even greater percentage of community, junior, and technical colleges have taken part. In the majority of local consortia, two-year colleges have acted as the fiscal agent for Tech Prep grants. Although the findings indicated little consistency in the size or composition of local consortia, it was apparent that multiple secondary schools, two-year

postsecondary schools, and business and industry often took part. On average, local consortia involved twelve secondary and two postsecondary schools in 1992-1993. The majority also involved an average of twenty-three private-sector business and industry firms. Other types of organizations inside or outside of education such as community-based organizations or student leadership groups were not typically identified as part of a consortium. Conspicuously absent from consortia were four-year colleges and universities, which may help to explain a widespread perception of a lack of support for Tech Prep by these institutions, a finding that surfaced repeatedly in this report.

The organizational structure of most local consortia included various committees or teams associated with particular program components as well as participating consortium schools. For example, the majority of coordinators reported having curriculum, planning, business and industry collaboration, staff development, guidance and counseling, and promotion and marketing committees or teams operating during the 1992-1993 year. In addition, most coordinators also reported having either site-based committees or teams in some or all of their schools. Consortium-level executive committees, governing boards, and/or advisory committees were widely used as well. These findings also showed that education personnel who contributed to local Tech Prep implementation activities represented several stakeholder groups with some groups more highly represented than others. Personnel at the secondary level outnumbered those from the postsecondary level in inservice and implementation activities. At both levels, vocational faculty, counselors, and administrators were represented more fully than academic faculty. Of these groups, secondary and postsecondary administrators and vocational faculty were perceived to be more supportive of Tech Prep than either counselors or academic faculty. Other groups perceived to be supportive were students, parents, business and industry representatives, state agency personnel, and secondary school boards. Rated at the bottom of the list of supporters were four-year college and university personnel, reinforcing our earlier point about their perceived lack of support for Tech Prep.

There can be no doubt that federal funding has played a critical role in facilitating local Tech Prep implementation efforts. Approximately two-thirds of all funds used for Tech Prep at the local level have been Perkins Title IIIE funds. Nearly all consortia have obtained some federal funding; 42% have had *only* federal funding. Yet, when funds other than Title IIIE were obtained from other local, state, or federal sources, as they were for 58% of those surveyed, they were substantial. For example, funds obtained from other

state or federal sources averaged $62,221, and funds from other local sources averaged $45,572, showing that other sources have contributed significant dollars to Tech Prep efforts. Although the total grant sum may sound sizable, averaging over $130,000 per consortium, a commonly reported issue for local coordinators was the adequacy of funds to make changes for Tech Prep. When considering the size of a typical Tech Prep consortium (averaging twelve secondary schools, two postsecondary schools, and twenty-three business and industry firms) and the magnitude of activities local practitioners were attempting to carry out, the amount of funding seemed very modest. Consequently, it was not surprising that a lack of funding arose as a top-ranked barrier to local implementation. Also contributing to this issue was the finding that relatively few private-sector business and industry funds were reported as financial contributors to Tech Prep efforts. Only 11% of the coordinators reported receiving funds from business and industry, and these average slightly over $9,000. It seems apparent a challenge for the future is in shifting funding from the "seed money" available from the federal level to the local and state levels as well as other alternative sources to ensure that Tech Prep can be woven into the fabric of education at the local level.

What is it that local coordinators say their consortia were attempting to accomplish when implementing Tech Prep? Our research looked at this question from several different perspectives. First, we asked what primary goal was to be addressed by local Tech Prep initiatives. Responses clustered around six themes with one theme somewhat dominant. Thirty-six percent of coordinators identified the goal of enhancing workforce, technology, and career preparation for students. Seventeen percent of coordinators described Tech Prep as reform of secondary education and another 16% indicated the primary goal to be about reaching various student groups, primarily while in high school. These latter two themes focused heavily on reform of secondary education, often making little or no reference to Tech Prep beyond that level. On the other hand, another 26% of the coordinators described goals for Tech Prep that primarily focused on postsecondary education and ensuring students had options beyond high school. Together, these six themes displayed a very diverse mission for Tech Prep. Inherent in that mission were contradictions and contending views about what local consortia thought Tech Prep should be about. This conclusion is reinforced by the responses of coordinators to a question about the primary target group for Tech Prep.

Local coordinators were asked to indicate the class rank percentiles of students they viewed to be the primary target group for their Tech Prep initiatives. Again, similar to the variation observed with goals, coordinators' responses were widely varied. Almost one-half of the coordinators selected the 25th-75th percentile, the so-called "neglected majority." Nearly another one-quarter selected the 50th-75th percentile, that is, those students whose academic performance ranked them just below the top quartile of college-bound students. Another 11% selected all students. Finally, another 14% selected other groups of students, often those in the bottom two class rank quartiles. The variation in these responses was reflective of the differences in primary goals for Tech Prep, particularly in goals that were seen as targeting particular aspects of Tech Prep to certain student populations, focusing Tech Prep at the secondary or postsecondary level, and giving Tech Prep a broader or narrower focus on workforce preparation. These findings support earlier research that noted, with concern, broad and conflicting goals for Tech Prep described by state agencies. To some degree, these issues have likely contributed to the barrier we labeled "resistance to change" as well as to the recommendation of local coordinators for greater clarity in federal Tech Prep policy. To the extent that Tech Prep is viewed as a highly targeted program or educational track, we fear that it may not play a role in restructuring education as many had hoped, especially where the goal of *all* students is predominant (Newmann, 1993; National Governors' Association, 1991). Clarifying the general intent of federal Tech Prep policy to assist in meeting the needs of *all* students would go a long way to assist practitioners with furthering local implementation efforts.

Interestingly, although variation was apparent in both the goals and intended audience for Tech Prep, it was not apparent in priorities set for student outcomes. Coordinator ratings of outcomes showed a high level of consensus. Fifteen of the seventeen student outcomes in the questionnaire were given a high or very high mean rating. The resultant fifteen highly rated outcomes presented a broad array of expectations for Tech Prep participants and graduates. They ranged from the top-ranked outcome of "improved knowledge and skills in math" to "increased interpersonal skills" to "employability in high-wage jobs" to "increased self-esteem." Together, these student outcomes could provide the basis for a core curriculum for Tech Prep that is highly focused on academics, career preparation, interpersonal and employability skills development, matriculation to postsecondary education, and eventual employment. These outcomes indicate that a highly integrated approach—one that requires both vocational and academic education—was favored by respondents. Findings also suggested the importance of

greater focus on increased standards for students, increased expectations for vocational and academic attainment, and improved matriculation from high school to college.

Findings from this study point out how curriculum reform associated with Tech Prep has been conceptualized, indicating that it has focused extensively on the secondary level, except in the creation of formal articulation agreements for vocational and academic programs—an action that required participation by both the secondary and postsecondary levels. Vocational areas most frequently identified as the focus of Tech Prep were business and office, trade and industrial, industrial technology education, and health occupations. Beyond articulation efforts, the predominant curriculum reform strategy used by local consortia was to add applied academics (commercially or locally developed) to existing curriculum or replace existing courses with applied academics, all at the secondary level. Consortia also reported supplementing existing academic courses with vocational material and vice versa. Action taken to organize curriculum around occupational/career clusters was also reported by slightly more than one-half of coordinators. Only in the case of using occupational/career clusters were any of these reform efforts carried out by more than one-half of local consortia at the postsecondary level, raising a concern about the postsecondary role in Tech Prep and curriculum reform.

A vast majority of consortia throughout the country have adopted aspects of the Tech Prep Associate Degree (TPAD) model, which is particularly evident in the large percentage reporting the use of applied academics. Implementation of other models such as the integrated or work-based Tech Prep models is far less likely to have occurred. However, a minority of consortia did report providing work-based learning, career academies, and/or interdisciplinary courses, indicating that some consortia may be experimenting with alternative approaches to TPAD. In fact, the study showed that there was a relationship between the overall stage of implementation of Tech Prep and conducting reforms such as work-based learning, interdisciplinary courses, and career academies, indicating increased use of a wider array of curriculum reform strategies as local consortia progress further along with the implementation of Tech Prep.

Beyond the essential area of curriculum, other components were identified as important to local consortium efforts. The findings showed a high level of consensus among local coordinators concerning the components that make up a Tech Prep initiative. Over 90% of the coordinators indicated that their consortium documents formally stated the

following as a focus of Tech Prep: formal articulation agreements; integrated vocational and academic curriculum; career guidance including career awareness and exploration; collaboration between educators and employers; equal access to the full range of Tech Prep for special populations; and common core curriculum in math, science, communications, and technologies. Over two-thirds of the coordinators also reported the foci of Tech Prep to include joint inservice for teachers, marketing, training of counselors, preparatory services, new teaching methods, and work-based learning. (Note that among these are the "essential elements" appearing in the Tech Prep Education Act.) Although coordinators concurred on the importance of these components, additional findings in this study indicate that the extent to which consortia had actually implemented these and other components varied depending on the length of time they had received Title IIIE funds and the stage of implementation of Tech Prep in the consortium overall. The stage of implementation of a few of the components was also related to whether the consortium was situated in a rural, suburban, or urban location.

Overall, 66% of the local consortia were perceived to be at the initial or advanced implementation stage; 33% were rated at the planning or development stage. However, this classification proved to be less useful than ratings of the thirty individual components that could be considered a part of Tech Prep. Of the thirty components, only the two of consortium building and formal articulation agreements received a mean rating of greater than 4.0, indicating these two components to be at the initial implementation stage. The vast majority of components, including those described previously as the formally stated foci of Tech Prep were given mean ratings of between 3.0 and 3.8 (development stage); eleven were rated below 3.0 (planning stage). Several of the "essential elements" still considered at the development stage were 2+2 core curriculum, joint inservice of faculty, training of counselors, and equal access. In addition, several other components seen as important to local implementation efforts received a mean rating placing them at only the planning stage. Included in this group were joint planning time, evaluation-related components such as program evaluation and alternative assessment, and STW-related components such as work-based learning and apprenticeships. Generally, Tech Prep components were rated at a higher stage of implementation when consortia were funded for two years with federal Title IIIE funds than for one year indicating that additional time and experience with Tech Prep may be related to progress toward local implementation.

A study of local implementation of Tech Prep would be incomplete without focusing at least partly on barriers. In the questionnaire, a list of fifty barriers was presented and respondents indicated their perceptions of the impact of each barrier from none to major. Of the fifty barriers, ten were rated over 3.7, indicating they were considered to be at or near the major impact level. The group mean indicated that the top barrier was that of little joint planning time for vocational and academic or secondary and postsecondary faculty. The next three barriers were (1) failure of four-year colleges to award credit for applied academics or Tech Prep courses; (2) lack of general awareness of Tech Prep; and (3) lack of staff, time, and money. Of the six remaining barriers at the major impact level, three focus on the potentially negative relationship between vocational education and Tech Prep. The other three barriers were as follows: (1) difficulties in changing within existing educational bureaucracies, (2) implementing change with personnel who lack the knowledge and skills to do so, and (3) resistance from academic educators.

The mean ratings of nineteen other barriers fell between three and four, indicating that they are seen as having a minor to moderate level of impact on the implementation of Tech Prep. These barriers were wide-ranging, but tended to focus on policy issues, funding problems, relationships between and attitudes of vocational and academic and secondary and postsecondary educators, and sources of resistance to Tech Prep reforms. The remaining twenty-one barriers were rated as having a very minor to minor impact on implementation. Overall, these barriers were indicative of concerns with local conditions and issues, stakeholder attitudes and involvement, administrative resistance, and lack of resources such as instructional materials and professional development experts.

These top-ranked barriers were examined by grouping respondents in the year first funded with Title IIIE monies. When examining the barriers according to the first year funded, nearly all the barriers were perceived to have more impact when consortia were funded in 1991 rather than 1992, possibly indicating that more time and experience with Tech Prep is related to greater understanding of the obstacles to it. To examine the interrelationships among barriers, a factor analysis of the barriers subscale was conducted. The factor analysis extracted the following five common factors: (1) resistance to change, (2) lack of clear policy, (3) lack of interest from external stakeholders, (4) lack of resources, and (5) lack of cooperation from postsecondary education. To some extent, these barriers reinforce the findings presented elsewhere in this study regarding the level of

support of particular groups for Tech Prep, actions taken to reform curriculum at the secondary and postsecondary levels, and stage of implementation of Tech Prep components.

The last set of findings in the report focuses on ten groups of recommendations for state or federal policy changes made by the local coordinators. Their responses were open-ended and categorized into ten thematic areas, many of which parallel the barriers identified in the previous section of the study. These recommendations focus on the following: (1) extending Tech Prep into grades lower than eleven; (2) providing more money; (3) providing more flexibility in using funds; (4) promoting Tech Prep at the highest local, state, and federal levels; (5) mandating Tech Prep at the state level; (6) authorizing support for Tech Prep for longer than three years; (7) ensuring federal policy has clear definitions and consistent goals for Tech Prep; (8) coordinating Tech Prep with other reform initiatives including Goals 2000 and STWO; (9) facilitating college credit for Tech Prep and increasing four-year school involvement; and (10) ensuring better evaluation, more accountability, and high standards for Tech Prep programs. These recommendations were consistent with the findings of the study and supported by the conclusions we have drawn from this research.

These findings, seen in total, have helped to describe the efforts of local consortia throughout the nation attempting to implement Tech Prep. Findings obtained from this study have addressed several important questions. First, is Tech Prep a reform of vocational education? Findings from this study indicate vocational education is an important part of Tech Prep as evidenced by the involvement and support of vocational faculty, the focus of goals and outcomes on vocational education, and the curriculum reform involving vocational curriculum, to name only a few. Over one-third of the respondents described the primary goal of Tech Prep as reform of education related to workforce, technology, or career preparation. Together these findings suggest Tech Prep is perceived to be reform of vocational education; some of the findings presented in this report point to progress made on vocational education reform with Tech Prep.

Second, is Tech Prep educational reform for *all*? Findings related to this question are somewhat ambiguous. They indicate that only a small number of local coordinators viewed their target population as *all* students or offered goals that focused on meeting the needs of all, even though equal access for all students was a component being implemented

by the vast majority of respondents. Similar to the conclusion drawn in the preliminary study of the National Assessment of Vocational Education (OERI, 1994), findings from this study lead us to conclude that Tech Prep is seen as an effort targeted primarily at those students often described as "neglected" by previous educational reform—consistent with Parnell's (1985) early vision. Changing this focus to all students, including those in either the highest or lowest quartile groups, will require clear and focused policy directives from the federal level.

Third, can Tech Prep be a vehicle to help students transition from school-to-work (STW)? These findings indicated that, at least to date, components linked to STW transition such as work-based learning and apprenticeships have not been widely implemented with Tech Prep, although the study has also shown that the majority of local coordinators indicate intentions to include work-based learning in Tech Prep. Again, with clear policy established at the federal level and then facilitated at the local and state levels, it appears there is little to prohibit Tech Prep from becoming a viable STW option.

Overall, these findings indicate that local consortia are engaging in a multitude of efforts to implement Tech Prep. Many promising trends and lingering challenges are evident—the very trends and challenges that will determine the role Tech Prep will play in the changing landscape of American education.

Promising Trends and Lingering Challenges

Findings obtained for the five research questions were helpful in capturing a comprehensive description of how local Tech Prep implementation has proceeded in the United States through the first two years of federal support. Among this wealth of information, the survey responses revealed the following *promising trends*:

- As many as 50% of the nation's high schools are identified by respondents as participants in Tech Prep implementation in a local consortium, indicating dramatic growth in Tech Prep activity at the secondary education level from 1991 (pre-Perkins II) to 1993 (post-Perkins II).

- Although it is nearly impossible to identify any organizational configuration of a local Tech Prep consortium as typical, these findings indicate that on average the

majority of local consortia consist of twelve high schools, two postsecondary schools, and ten private-sector business and industry firms. The organizational structure of the consortium, including secondary schools, postsecondary schools, business and industry, and sometimes other organizations, may enhance Tech Prep implementation efforts.

- Coordinator ratings of student outcomes showed a high level of consensus. Fifteen of the seventeen student outcomes were given a "high" or "very high" mean rating. These fifteen highly rated outcomes presented a broad array of expectations for Tech Prep participants and graduates, incorporating the areas of academic skill attainment, employability skill attainment, and matriculation from high school to college.

- Several stakeholder groups showed a high level of support for Tech Prep. The level of support for seven different groups was rated, on average, to be "good" to "excellent." These groups were state agency personnel, vocational faculty, local two-year postsecondary administrators, business/industry representatives, local secondary administrators, students, and secondary school board members. Only one group was given an average rating of "fair." This group was four-year college/university personnel.

- Professional development of secondary and postsecondary personnel has been carried out by nearly all local consortia. Nearly 90% reported joint inservice training for teachers from throughout an entire consortium to be a formally stated focus on their Tech Prep initiative. Professional development of secondary personnel regarding Tech Prep was more prevalent than of postsecondary personnel; although, on average, one-half of vocational faculty, counselors, and administrators at both levels were reported to have participated in Tech Prep inservice in local consortia.

The data from this research also revealed the following *lingering challenges*:

- Most of the Tech Prep coordinators worked on Tech Prep part-time or as part of their regular job. Other resource constraints were evident in the findings, including the widespread perception of a lack of joint planning time and a lack of staff, time, and money as barriers to local implementation.

- The Tech Prep initiative has broad and conflicting goals and, as such, Tech Prep access may not be available to *all* students, even though equal access for all students was reported as a priority for most consortia. The findings show the vast majority of local consortia directing curriculum goals to serve the middle two quartiles of students in academic ability, bringing into question the role Tech Prep can and should play in educational restructuring endeavors.

- Little postsecondary curriculum reform and development for Tech Prep was reported except for formal articulation of vocational and academic courses. Over one-half of the respondents also reported implementing occupational/career clusters at the secondary and postsecondary levels. In addition, the findings associated with curriculum reform show that at the secondary or postsecondary levels few local consortia were engaged in what might be considered more advanced and complex curriculum reform such as providing advanced-skills courses, career academies, or interdisciplinary courses.

- School-to-work components such as work-based learning and apprenticeship have not been widely implemented. However, work-based learning was identified as a formally stated focus of two-thirds of the local consortia participating in the study and the level of implementation of work-based learning was perceived to be higher for consortia funded in 1991 than in 1992.

- The most serious barriers to the implementation of Tech Prep are deeply rooted and have not been surmounted. The obstacles of not enough time designated for joint planning by vocational and academic or secondary and postsecondary faculty; the failure of four-year colleges and universities to award college credit for applied academic or other Tech Prep courses; a lack of general awareness about Tech Prep; and the lack of staff, time, and money were perceived by respondents as having the most impact on their activities, and their impact has remained serious with the passage of time.

Recommendations

The data collected and analyzed from this national study of local Tech Prep implementation supports the following recommendations:

- Due to the growing involvement in Tech Prep activities across the nation and the reality that change within public schools requires time, funding for the Tech Prep initiative should be continued at the federal level and expanded to include local and state funds. Financial support must be continued to bolster the existing efforts to induce systemic change within the nation's public school and two-year college system.

- The scope and focus for students involved with Tech Prep should be expanded beyond the 2+2 concept to include the participation of change agents at other educational levels, especially elementary and middle schools, and colleges and universities.

- With global economic competition a reality and with the development of human resources recognized as a key factor in the economic development of the nation, Tech Prep should be promoted and marketed on a national level as a viable avenue for U.S. citizens to attain the necessary requirement of lifelong learning and global workforce skills; the need for marketing of Tech Prep concepts is also critical at the local and state levels where workforce development and economic needs are most acute.

- Accountability, high standards, and evaluation of Tech Prep programs are all imperative to ensure that the goals of this federally supported initiative are being met. This research has revealed that only a small percentage of Tech Prep consortia are actively addressing the issues of evaluation and accountability. Therefore, the funding agencies for Tech Prep should develop viable on-site accountability and evaluation mechanisms that can ensure that high standards and expectations are being identified and met.

- The nation's public schools are caught in a quagmire of different national reform initiatives such as Goals 2000, School-to-Work Opportunities, and Tech Prep, with many more reform initiatives dictated to public schools at the local and state levels. This uncoordinated educational reform effort creates confusion and fragmentation

of activities within schools as evidenced by the "fad" perception that many of these efforts hold among teachers, parents, and school administrators. A concerted effort at all administrative levels is needed to link reform initiatives together that can build on existing efforts, improve upon the reform processes, and move forward with school reform initiatives.

- The barriers to implementation of Tech Prep should receive special notice. Research should be developed to search for and discover why barriers exist in various educational environments, especially among teachers and educational institutions, which are perceived to be the "great equalizer and designed to empower our nation's people" and not the contrary as this research indicates.

With a growing number of local consortia having made commitments to the Tech Prep concept, support is evident among vocational educators, postsecondary administrators, employers, parents, students, and other groups. There is evidence to suggest that at least some local consortia are beginning to use Tech Prep to improve existing educational systems and expand students' opportunities to be productive in the workplace and in their academic pursuits. A continuing challenge for the nation is to support the many local Tech Prep consortia that show commitment to Tech Prep in ways that can ensure reform will be significant and lasting.

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APPENDIX A

Table 15
Survey Population, Sample, and Response Rate by State

State	Number Consortia As of June 1993	Number Consortia Surveyed	Number and Percent Responding
Alabama	32	16	12 (75%)
Alaska	3	3	2 (67%)
Arizona	14	7	6 (86%)
Arkansas	13	7	7 (100%)
California	70	35	30 (86%)
Colorado	20	10	7 (70%)
Connecticut	14	7	4 (57%)
DC	1	1	1 (100%)
Delaware	1	1	1 (100%)
Florida	17	9	7 (77%)
Georgia	58	29	24 (83%)
Hawaii	1	1	1 (100%)
Idaho	6	6	4 (66%)
Illinois	40	20	20 (100%)
Indiana	18	9	7 (83%)
Iowa	6	6	5 (83%)
Kansas	6	6	4 (66%)
Kentucky	44	22	16 (73%)
Louisiana	13	7	7 (100%)
Maine	6	6	6 (100%)
Maryland	16	8	8 (100%)
Massachusetts	11	6	5 (83%)
Michigan	39	20	17 (85%)
Minnesota	24	12	9 (75%)
Mississippi	14	7	7 (100%)

Table 15 (cont.)

State	Number Consortia As of June 1993	Number Consortia Surveyed	Number and Percent Responding
Missouri	12	6	5 (83%)
Montana	4	4	3 (75%)
Nebraska	6	6	6 (100%)
Nevada	3	3	3 (100%)
New Hampshire	4	4	3 (75%)
New Jersey	21	11	9 (82%)
New Mexico	13	7	7 (100%)
New York	28	14	11 (79%)
North Carolina	47	23	23 (100%)
North Dakota	1	1	1 (100%)
Ohio	13	7	7 (100%)
Oklahoma	10	10	8 (80%)
Oregon	20	11	9 (82%)
Pennsylvania	22	11	11 (100%)
Rhode Island	1	1	1 (100%)
South Carolina	16	8	7 (88%)
South Dakota	4	4	4 (100%)
Tennessee	15	8	6 (75%)
Texas	25	14	11 (79%)
Utah	11	6	4 (67%)
Vermont	9	9	6 (67%)
Virginia	34	17	13 (76%)
Washington	18	9	8 (89%)
West Virginia	11	6	5 (83%)
Wisconsin	16	8	6 (75%)
Wyoming	4	4	3 (75%)
TOTAL	855	473	397 (84%)

APPENDIX B

Aggregated Responses to Local Tech Prep Implementation Survey

Survey Instructions for Tech Prep Coordinators

Since passage of the federal Tech Prep legislation, local consortia have been forming across the United States. The National Center for Research in Vocational Education (NCRVE) is conducting research to better understand how Tech Prep is progressing nationwide and to identify barriers that need to be overcome in future implementation efforts. Your consortia has been randomly selected from all local consortia throughout the country to be part of this survey. We need your assistance to determine how Tech Prep is being implemented at your site.

You may be assured complete confidentiality regarding your responses to this questionnaire. An identification number appears on the questionnaire for mailing purposes only. Your name will never be placed on the questionnaire and your responses will only be reported in aggregate form.

The survey has the following five parts and it is essential that you provide responses to the questions in all the parts of the questionnaire.

Part I:	**Tech Prep Goals & Outcomes**
Part II:	**The Stage of Implementation of Tech Prep**
Part III:	**Barriers to Tech Prep Implementation**
Part IV:	**Tech Prep Consortium Characteristics**
Part V:	**Tech Prep Coordinator Background**

Most questions require you circle responses. A few questions require you print a short answer. Typing is not necessary. Respondents in the pilot of this survey reported completion time ranged between forty-five minutes to one hour.

If any problems or questions arise as you complete the survey, please refer them immediately to

Debra Bragg	(217) 333-0807 or (217) 244-4260	FAX: (217) 244-5632
James Layton	(217) 333-0807 or (217) 244-3537	FAX: (217) 244-5632

Once you have completed the questionnaire, please mail it to us as quickly as possible; *no later than June 30, 1993*. The enclosed pre-addressed envelope is included for your convenience. Should you use other cover, please send your survey to

Dr. Debra Bragg
NCRVE Site, University of Illinois
344 Education Building
1310 South Sixth Street
Champaign, IL 61820

PART I: TECH PREP GOALS & OUTCOMES

Q-1. Which of the following components of Tech Prep is *formally stated in writing* in a mission statement, proposal, policy, plan, marketing brochure, or other official document(s) as the focus of your consortium's Tech Prep initiative?

Tech Prep Component	YES	NO
1. Common core curriculum in math, science, and communications (including applied academics) and technologies leading to an associate degree, certificate, or apprenticeship in a career field *(n=393)*	91.9%	8.1%
2. New teaching methods such as cooperative learning appropriate for varied student needs and learning styles *(n=385)*	71.9%	28.1%
3. Integrated academic and vocational curriculum *(n=390)*	95.6%	4.4%
4. Alternative learner assessment (e.g., performance assessment, portfolios) *(n=185)*	60.5%	39.5%
5. Career guidance including career awareness and exploration *(n=393)*	93.6%	6.4%
6. Formal articulation agreements to create 2+2 program-area course sequences between secondary and postsecondary schools *(n=391)*	96.4%	3.6%
7. Work-based learning experiences (e.g., youth apprenticeships, cooperative education, school academies) *(n=384)*	67.7%	32.3%
8. Employment assistance & job placement services *(n=380)*	46.8%	53.2%
9. Equal access to the full range of Tech Prep for special populations *(n=393)*	91.9%	8.1%
10. Preparatory services for all participants in Tech Prep *(n=377)*	78.5%	21.5%
11. Joint inservice training for teachers from the entire consortium *(n=388)*	89.9%	10.1%
12. Training programs for counselors designed to enable them to recruit students and ensure they complete programs and obtain employment *(n=388)*	82.5%	17.5%
13. Collaboration between educators and employers to enhance education *(n=385)*	92.5%	7.5%
14. Marketing of Tech Prep programs *(n=386)*	87.0%	13.0%
15. Other responses: Internships, work experience, mentorships; program evaluation; curriculum articulation, alignment, applied academics, common core, integration; adult bridge programs; career development, pathways, centers. *(n=45)*		

Note: Due to the omission of response categories for item 4, the findings for this category are likely to underrepresent actual activity. Therefore, readers are urged to interpret and report statistics related to alternative learner assessment cautiously.

Q-2. There are many reasons to implement Tech Prep. Briefly state the *one primary goal* of your Tech Prep initiative.

36% Workforce, technology, and career preparation
17% Reform secondary education
16% Reach student groups
13% Continue to postsecondary education
13% Options beyond high school
5% Other goals

Q-3. During the 1992-1993 academic year, which of the following *types of committees or teams* operated (e.g., held meetings, developed policy) in your Tech Prep consortium? *(Circle all that apply.) (n=397)*

Committee or Team Type	YES	NO
1. Executive committee/Governing board	77.6%	22.4%
2. Advisory committee	74.8%	25.2%
3. Planning	72.3%	27.7%
4. Curriculum	86.4%	13.6%
5. Evaluation	36.8%	63.2%
6. Promotion/marketing	60.7%	39.3%
7. Staff development	68.3%	31.7%
8. Counseling/guidance	63.5%	36.5%
9. Business/industry collaboration	70.0%	30.0%
10. Implementation	45.1%	54.9%
11. Other responses: Steering committee, leadership, administration, applied academics, special populations/needs, maintenance, career awareness/ guidance, integration, school-to-work.	11.3%	88.7%

Q-4. Did your consortium have site-based committees or teams at participating secondary and postsecondary schools in the consortium during the 1992-1993 academic year? *(Circle one response.) (n=395)*

43.5% YES, at some schools
27.3% YES, at all schools
18.2% NO, but plans call for site-based committees/teams in the future
6.8% NO, and there are no plans for site-based committees/teams in the future
4.1% Other

Q-5. Which of the following class rank percentiles best describes the *primary target group(s)* of students for your Tech Prep initiative? *(Circle all that apply.) (n=389)*

45.5%	25th-75th
23.0%	50th-75th
10.5%	All percentiles
5.9%	25th-50th
5.6%	25th-100th
1.8%	50th-100th
3.8%	0-75th
1.5%	Other
1.0%	75th-100th
0.8%	0-25th

Q-6. During the 1992-1993 academic year, which vocational education program areas were part of the Tech Prep curriculum reform efforts? *(Circle all that apply.) (n=397)*

Vocational Program Areas	**YES**	**NO**
1. Agriculture	27.7%	72.3%
2. Business and Office	79.3%	20.7%
3. Health Occupations	50.6%	49.4%
4. Marketing/Distributive Education	31.5%	68.5%
5. Occupational Home Economics	22.7%	77.3%
6. Consumer and Homemaking	13.6%	86.4%
7. Trade & Industrial	61.0%	39.0%
8. Industrial Technology Education	57.9%	42.1%
9. Other	16.1%	83.9%

Q-7. During the 1992-1993 academic year, which of the following represent(s) the focus of Tech Prep curriculum reform efforts that occurred in your consortium at the *secondary and postsecondary* levels? *(Circle all that apply.)*

Curriculum Reform Effort	At the *secondary* level during '92-'93? Yes	No	At the *postsecondary* level during '92-'93? Yes	No
Supplement existing vocational-technical courses with academic content *(n=368/305)*	76.1%	23.9%	42.6%	57.4%
Supplement existing academic courses with vocational-technical content *(n=369/297)*	72.1%	27.9%	34.3%	65.7%
Add applied academic courses (commercially or locally developed) to the existing curriculum *(n=381/305)*	86.4%	13.6%	37.7%	62.3%
Replace parts of the existing curriculum with applied academic courses (commercially or locally developed) *(n=375/298)*	77.9%	22.1%	29.9%	70.1%
Coordinate vocational-technical and academic courses by sequencing and reinforcing related content, often through block scheduling *(n=368/300)*	56.5%	43.5%	32.0%	68.0%
Provide interdisciplinary courses combining vocational-technical and academic content (e.g., History of Work) *(n=364/301)*	37.4%	62.6%	22.3%	77.7%
Organize vocational-technical and academic courses around occupational/career clusters *(n=373/310)*	68.9%	31.1%	51.6%	48.4%
Provide "academies" combining courses from vocational-technical areas and math, science, communications, and other academic areas *(n=363/296)*	39.9%	60.1%	23.3%	76.7%
Articulate academic program-area course sequences between the secondary and postsecondary levels *(n=368/331)*	69.6%	30.4%	69.2%	30.8%
Articulate vocational-technical program-area course sequences between the secondary and postsecondary levels *(n=382/335)*	89.5%	10.5%	88.1%	11.9%
Add advanced-skills courses to the existing curriculum *(n=355/306)*	40.6%	59.4%	35.3%	64.7%
Provide work-based learning outside the formal structure of schools as a significant portion of student learning (e.g., internship, apprenticeship) *(n=366/309)*	46.2%	53.8%	39.8%	60.2%

Other responses: Transitional courses at postsecondary level, core curriculum/competencies, add/incorporate SCANS, develop TQM component; infuse career skills in state-mandated curricula, enhance student assessment Career Awareness; youth apprenticeship, work experience; language remediation assistance; align secondary curriculum; improve technical associate degree; DACUM. *(n=32)*

Q-8. Which educational reforms were implemented in *any* participating secondary or postsecondary schools in your Tech Prep consortium during the 1992-1993 academic year? *(Circle all that apply.)*

	YES	NO
1. America 2000 initiative	39.3%	60.7%
2. Secondary school reforms (e.g., Coalition of Essential Schools, Effective Schools)	42.6%	57.4%
3. Postsecondary/higher education reforms (e.g., multicultural, general education reform)	28.0%	72.0%
4. School-to-work transition reforms (e.g., youth apprenticeship, school academies)	38.3%	61.7%
5. Total Quality Management (TQM) (e.g., quality improvement, employee involvement)	41.6%	58.4%
6. Other responses: Integration, SCANS, SREB, Beacon School initiative, outcomes-based education, cooperative learning, state reform initiatives, competency-based education, quality schools, cooperative work experience, site-based management.	15.6%	84.4%

Q-9. Tech Prep could impact secondary and postsecondary students in many different ways. Review the following list of student outcomes and indicate the level of priority that your Tech Prep consortium gives to each outcome. *(Circle 9 only if the outcome is Not Applicable [NA] to your Tech Prep initiative.)*

Student Outcome	Level of Priority (Circle the one best response)					
	Very Low	Low	Moderate	High	Very High	NA
Improved knowledge and skills in English/communications *(n=392)*	0.0%	1.0%	8.9%	35.7%	53.8%	0.5%
Increased interpersonal skills (e.g., team & leadership skills) *(n=392)*	0.0%	1.8%	15.8%	39.0%	42.6%	0.8%
Increased problem solving, thinking, and reasoning skills *(n=393)*	0.0%	1.3%	2.8%	33.3%	61.8%	0.8%
Improved knowledge and skills in math *(n=394)*	0.3%	0.3%	5.1%	30.2%	63.7%	0.5%
Improved knowledge and skills in science *(n=393)*	0.5%	1.3%	9.7%	36.4%	51.7%	0.5%
Increased knowledge and skills in vocational-technical areas *(n=393)*	0.3%	0.8%	7.9%	37.7%	52.9%	0.5%
Increased self-esteem *(n=394)*	0.5%	2.0%	24.1%	39.6%	32.5%	1.3%
Increased motivation for learning *(n=392)*	0.0%	0.8%	11.2%	39.3%	48.0%	0.8%
Improved employability skills and work readiness *(n=394)*	0.3%	1.0%	4.1%	33.2%	60.9%	0.5%
Increased awareness of and interest in technical careers *(n=392)*	0.5%	0.8%	6.4%	38.8%	53.3%	0.3%
Increased secondary school completion rate *(n=392)*	0.5%	2.0%	15.1%	33.2%	47.7%	1.5%
Increased matriculation from secondary to postsecondary levels *(n=393)*	0.3%	0.5%	7.6%	35.4%	55.5%	0.8%
Increased postsecondary school completion rate *(n=394)*	1.0%	2.8%	18.8%	37.1%	36.5%	3.8%
Increased matriculation from two-year to four-year college *(n=390)*	2.6%	14.4%	39.5%	25.4%	11.5%	6.7%
Increased job placement rate *(n=392)*	0.8%	4.3%	21.7%	39.0%	30.6%	3.6%
Increased employability in high-wage jobs *(n=392)*	0.5%	2.3%	20.4%	40.1%	32.9%	3.8%
Increased satisfaction of students/graduates with jobs *(n=392)*	0.8%	4.1%	21.4%	37.5%	32.7%	3.6%

Q-10. Thinking about your overall experience with Tech Prep implementation thus far, how would you describe support for Tech Prep from the following interest groups? *(Circle 9 only if the interest group is Not Applicable [NA] to your Tech Prep initiative.)*

Interest Group	Level of Support *(Circle the one best response)*				
	Poor	Fair	Good	Excellent	NA
Academic faculty *(n=394)*	4.3%	30.5%	43.7%	21.1%	0.5%
Vocational faculty *(n=395)*	1.3%	8.9%	38.5%	51.1%	0.3%
Counselors *(n=395)*	5.3%	26.1%	43.0%	25.1%	0.5%
Local secondary administrators *(n=395)*	2.5%	17.0%	41.3%	39.2%	0.0%
Local two-year postsecondary administrators *(n=395)*	1.5%	11.4%	36.2%	50.4%	0.5%
Business/industry representatives *(n=394)*	2.3%	10.2%	37.6%	47.2%	2.8%
Labor union representatives *(n=386)*	7.5%	13.7%	13.2%	11.9%	53.6%
State agency personnel *(n=393)*	2.5%	9.2%	30.3%	53.7%	4.3%
Four-year college/university personnel *(n=391)*	20.2%	25.6%	23.0%	6.9%	24.3%
Secondary school board members *(n=393)*	3.6%	20.6%	39.1%	31.2%	5.6%
College trustees *(n=387)*	9.3%	14.5%	24.3%	20.2%	31.8%
Students *(n=391)*	2.0%	14.6%	48.3%	25.3%	9.7%
Parents *(n=388)*	2.3%	20.4%	48.5%	19.1%	9.8%

PART II: THE STAGE OF IMPLEMENTATION OF TECH PREP

Q-11. This question focuses on the stage of implementation of components of your Tech Prep initiative. For each component, indicate the stage of implementation of the *most typical* organization(s) in your local consortium. The stages of implementation are as follows:

1	*Not Begun*	This stage indicates the component has not been addressed.
2	*Planning*	This stage includes goal setting, staff orientation, the formation of committees and teams, and the development of plans for a component.
3	*Development*	This stage involves such activities as reviewing, designing, creating, and field testing a component.
4	*Initial Implementation*	This stage occurs when plans and products of the developmental stage begin to be carried out for a component.
5	*Advanced Implementation*	This stage occurs when a component is routinely carried out, regularly reviewed and evaluated, and institutionalized so that it continues even if current leaders are no longer responsible for Tech Prep.
9	*Not Addressed (NA)*	This category indicates that your consortium does not intend to include the component in its Tech Prep initiative.

Tech Prep Component	Stage of Implementation (Circle the one best response) Not Begun	Plan	Develop	Initial Implement	Advanced Implement	NA
Consortium building (including recruiting schools, colleges, employers, and other organizations) *(n=395)*	0.8%	7.1%	10.4%	43.8%	37.2%	0.8%
Site-based planning and decision making for Tech Prep *(n=393)*	3.3%	15.8%	20.6%	39.9%	18.3%	2.0%
Team building to facilitate Tech Prep planning and implementation *(n=395)*	1.5%	9.9%	18.7%	46.1%	23.3%	0.5%
Long-range and/or strategic planning for Tech Prep *(n=392)*	3.8%	13.3%	25.8%	39.5%	17.1%	0.5%
Formal partnerships with business and industry *(n=394)*	7.9%	20.6%	30.2%	27.4%	13.5%	0.5%
Joint inservice of secondary and postsecondary personnel (e.g., faculty, counselors, administrators) *(n=395)*	4.1%	8.6%	16.2%	44.6%	26.6%	0.0%
Inservice training of counselors in recruitment, placement, and retention of students for Tech Prep *(n=395)*	4.1%	19.2%	21.5%	39.5%	15.2%	0.5%
Workplace professional development experiences for teachers and counselors *(n=394)*	18.0%	18.5%	20.6%	29.7%	11.7%	1.5%
Joint planning time for vocational and academic teachers *(n=393)*	17.3%	26.0%	22.1%	23.2%	9.4%	2.0%
Collaboration between vocational and academic educators *(n=395)*	5.6%	19.5%	29.1%	30.9%	14.4%	0.5%

Tech Prep Component (cont.)	**Stage of Implementation** *(Circle the one best response)* Not Begun	Plan	Develop	Initial Implement	Advanced Implement	NA
Formal signed articulation agreement(s) between secondary and postsecondary schools *(n=396)*	4.0%	8.3%	12.4%	31.6%	42.7%	1.0%
Labor market analysis to inform curriculum development *(n=393)*	15.3%	15.5%	20.1%	27.5%	18.6%	3.1%
Development of 2+2 core technical and academic curriculum *(n=395)*	2.5%	15.9%	20.8%	38.5%	21.8%	0.5%
Development of *advanced-skills* technical curriculum *(n=393)*	22.1%	23.2%	21.1%	23.9%	7.9%	1.8%
Integration of vocational and academic *secondary* curriculum *(n=395)*	4.3%	17.7%	31.6%	34.9%	10.6%	0.8%
Integration of vocational and academic *postsecondary* curriculum *(n=387)*	19.1%	25.3%	23.3%	21.2%	7.8%	3.4%
Use of outcomes-based education for Tech Prep *(n=391)*	13.3%	24.0%	24.8%	25.8%	9.5%	2.6%
Use of new instructional strategies (including cooperative learning approaches) *(n=396)*	7.1%	22.7%	25.5%	31.1%	12.1%	1.5%
Alternative assessments (e.g., portfolios, performance assessment) *(n=390)*	17.9%	26.2%	22.6%	23.1%	7.7%	2.6%
Career awareness and exploration for students in Tech Prep *(n=395)*	7.3%	21.8%	24.8%	29.9%	15.9%	0.3%
Work-based learning for students (e.g., internships, apprenticeships) *(n=395)*	20.3%	27.3%	23.5%	19.5%	7.1%	2.3%
Apprenticeships spanning secondary and postsecondary education *(n=393)*	37.9%	29.5%	15.3%	8.1%	2.5%	6.6%
Job placement services for students/graduates *(n=391)*	32.0%	22.0%	13.6%	14.8%	12.8%	4.9%
Marketing and promotions *(n=396)*	6.3%	16.2%	23.7%	32.8%	20.5%	0.5%
Guidance and counseling services *(n=396)*	5.8%	22.2%	27.3%	31.8%	12.6%	0.3%
Equal access for all students *(n=397)*	3.3%	17.2%	18.0%	32.4%	28.9%	0.3%
Strategies to address the needs of special populations *(n=396)*	7.1%	24.0%	27.5%	27.5%	13.4%	0.5%
Preparatory services for all participants *(n=387)*	7.8%	24.3%	26.9%	25.8%	14.0%	1.3%
Evaluation of Tech Prep programs *(n=396)*	13.6%	24.5%	28.5%	23.0%	9.8%	0.5%
Computer monitoring of student progress through Tech Prep programs *(n=393)*	39.4%	24.9%	16.0%	11.7%	3.8%	4.1%

Q-12. Take a few minutes to review your responses to the previous question (Q-11). Now, to summarize, indicate the stage of implementation that best describes your Tech Prep consortium overall. *(Circle the one best response.) (n=387)*

10.6%	Planning
23.5%	Development
51.9%	Initial Implementation
12.9%	Advanced Implementation
1.0%	Other

PART III: BARRIERS TO TECH PREP IMPLEMENTATION

Q-13. Barriers stand in the way of implementation of any new educational program. This question focuses on identifying barriers to implementation of Tech Prep. For each of the barriers listed below, indicate the level of impact it *has had or is having* on your consortium's Tech Prep initiative.

Barrier	Level of Impact (Cirele the one best response) None	Very Minor	Minor	Moderate	Major	Very Major
Negative attitude toward vocational education *(n=393)*	2.5%	9.2%	24.7%	40.2%	17.6%	5.9%
Lack of staff, time, and money dedicated to Tech Prep *(n=396)*	2.5%	7.3%	18.9%	34.8%	27.0%	9.3%
Failure of educators to see the need to change *(n=395)*	3.8%	13.4%	25.8%	32.2%	19.2%	5.6%
Turf battles between secondary and postsecondary educators *(n=396)*	9.8%	20.2%	33.3%	22.7%	9.8%	4.0%
Looking at Tech Prep as vocational education by another name *(n=393)*	4.1%	11.5%	24.9%	33.6%	19.8%	6.1%
Lack of general awareness about Tech Prep *(n=396)*	1.5%	6.6%	18.9%	38.1%	27.0%	7.8%
Belief that Tech Prep is an educational "fad" that will go away *(n=395)*	4.3%	10.6%	21.5%	33.2%	21.0%	9.4%
Failure of two-year postsecondary schools to accommodate Tech Prep students *(n=387)*	29.2%	31.3%	21.4%	12.7%	4.7%	0.8%
Failure of four-year colleges and universities to award college credit for applied academic or other Tech Prep courses *(n=378)*	10.3%	9.3%	12.2%	20.1%	25.9%	22.2%
Difficulty in dealing with educational bureaucracies *(n=391)*	4.3%	9.5%	23.3%	34.5%	17.6%	10.7%
Lack of support from business and industry *(n=392)*	24.2%	28.8%	29.6%	13.0%	3.3%	1.0%
Lack of support from labor organizations *(n=362)*	36.7%	23.8%	22.1%	9.1%	4.4%	3.9%
Lack of availability of integrated vocational and academic curriculum materials *(n=393)*	14.5%	25.7%	29.3%	20.9%	7.9%	1.8%
Conflict with other educational reform movements *(n=395)*	22.0%	26.3%	24.6%	17.0%	6.1%	4.1%
Resistance from secondary school administrators to Tech Prep *(n=394)*	15.7%	23.6%	26.9%	23.1%	8.4%	2.3%
Resistance from postsecondary school administrators to Tech Prep *(n=393)*	25.3%	25.3%	27.1%	14.8%	5.1%	2.3%
Difficulty reaching consensus among curriculum planners on reform strategies *(n=389)*	12.3%	27.2%	29.3%	20.6%	8.7%	1.8%
Lack of funds for curriculum reform *(n=395)*	9.6%	13.9%	20.5%	27.8%	18.7%	9.4%
Failure to employ local Tech Prep coordinator full-time *(n=391)*	42.2%	7.2%	12.3%	13.8%	13.3%	11.3%
Lack of experts to provide inservice about Tech Prep *(n=391)*	22.0%	21.5%	27.1%	18.7%	8.2%	2.6%
Resistance from academic educators to make changes for Tech Prep *(n=394)*	2.3%	14.5%	25.4%	31.7%	21.3%	4.8%

Barrier	Level of Impact (Circle the one best response) None	Very Minor	Minor	Moderate	Major	Very Major
Resistance from vocational educators to make changes for Tech Prep *(n=390)*	9.7%	23.6%	34.6%	21.3%	9.0%	1.8%
Resistance from secondary schools to introduce Tech Prep into the curriculum *(n=392)*	9.7%	20.2%	27.6%	30.4%	9.9%	2.3%
Resistance from postsecondary schools to introduce Tech Prep into the curriculum *(n=390)*	15.4%	20.0%	26.7%	26.4%	8.2%	3.3%
Difficulty in developing formal articulation agreements between secondary and postsecondary schools *(n=392)*	22.2%	26.3%	21.7%	22.4%	5.6%	1.8%
Lack of collaboration between vocational and academic educators *(n=393)*	3.6%	15.8%	29.8%	33.6%	13.2%	4.1%
Lack of knowledge and skills among education personnel in how to implement educational change *(n=392)*	3.6%	10.5%	23.7%	37.2%	19.9%	5.1%
Little time for joint planning by academic and vocational or secondary and postsecondary faculty *(n=392)*	2.8%	6.4%	17.6%	28.8%	28.6%	15.8%
Lack of credibility of vocational educators involved with Tech Prep *(n=394)*	11.9%	29.9%	30.7%	21.1%	4.1%	2.3%
Lack of clear *federal* level policy for Tech Prep *(n=394)*	14.0%	21.1%	26.4%	20.3%	11.9%	6.3%
Lack of clear *state* level policy for Tech Prep *(n=396)*	12.1%	21.2%	18.7%	22.5%	14.6%	10.9%
Lack of clear *local* level policy for Tech Prep *(n=393)*	13.2%	23.2%	22.6%	24.9%	9.7%	6.4%
Lack of support from *both* state secondary and postsecondary agencies *(n=393)*	17.8%	23.7%	28.2%	17.8%	6.6%	5.9%
Turnover of local or state leaders involved in Tech Prep *(n=392)*	25.5%	28.1%	21.2%	12.8%	7.7%	4.8%
Too much flexibility in local implementation of Tech Prep *(n=391)*	30.4%	29.9%	24.3%	10.0%	4.3%	1.0%
Funding for Tech Prep limited to vocational education sources *(n=393)*	20.3%	15.2%	17.5%	22.8%	14.5%	9.6%
Limitations in using Tech Prep funds for equipment or instructional materials purchases *(n=391)*	11.5%	18.4%	21.0%	22.8%	17.4%	9.0%
Limitations in using Tech Prep funds beyond grades 11-14 *(n=398)*	24.4%	20.3%	18.5%	13.9%	14.7%	8.2%
Lack of evaluation mechanisms to inform implementation *(n=386)*	10.6%	17.9%	26.9%	27.5%	13.7%	3.4%
Lack of authority of local personnel to make changes needed to implement Tech Prep *(n=394)*	12.7%	19.8%	25.4%	22.3%	12.2%	7.6%
Pressure from special interest groups to modify Tech Prep *(n=392)*	42.9%	27.3%	17.6%	6.9%	3.1%	2.3%
Lack of active involvement from business and industry *(n=394)*	22.6%	26.4%	24.4%	16.8%	7.6%	2.3%
Lack of jobs in the region for Tech Prep graduates *(n=393)*	13.7%	17.3%	20.1%	25.2%	14.2%	9.4%
Lack of parental support for Tech Prep *(n=386)*	16.3%	20.7%	29.0%	23.1%	8.8%	2.1%
Lack of student interest in Tech Prep *(n=386)*	15.5%	23.8%	30.3%	22.5%	6.2%	1.6%

Barrier	Level of Impact (Circle the one best response) None	Very Minor	Minor	Moderate	Major	Very Major
Inability of young people to make early career decisions *(n=387)*	8.0%	18.9%	21.2%	30.2%	17.3%	4.4%
Lack of counselor interest in or involvement with Tech Prep *(n=390)*	10.3%	16.4%	19.7%	27.9%	17.4%	8.2%
Lack of cooperation from teachers' unions *(n=367)*	47.4%	20.7%	17.7%	8.7%	4.4%	1.1%
Difficulty maintaining momentum over the long term *(n=390)*	16.4%	16.9%	27.9%	21.5%	13.1%	4.1%
Pressure for quick success and student head counts *(n=393)*	16.0%	12.2%	16.5%	25.7%	17.3%	12.2%

Other responses: Size of region & number of schools, consortium too big, widespread geography; lack of integrated concept between Tech Prep and youth apprenticeship, incompatibility with federally funded apprenticeship in region; lack of funding of grades 8, 9, & 10, local tight budget, crisis of school funding, funds for proper administration and marketing; applied academics rather than true integration, articulation defined as early completion, different approaches of secondary systems, resistance to DACUM, lack of developed competencies for occupational areas; lack of recent workforce experience among school personnel; lack of interest & support of upper-level administration; too much state involvement in day-to-day operations; staggering paperwork for Perkins; fiscal agent usurps autonomy; lack of cooperation from state professional organizations; identification that Tech Prep tracks students; lack of support from student services side of postsecondary. *(n=30)*

PART IV: TECH PREP CONSORTIUM CHARACTERISTICS

Q-14. *Estimate* the number of organizations that participated in Tech Prep implementation in your consortium during the 1992-1993 year. *(Enter 0 [zero] if no such organizations participated.)*

Type of Organization	Number in Consortium *(mean)*
Secondary schools (e.g., comprehensive high schools, area or regional vocational schools, vocational high schools) *(n=364)*	11.60
If readily available, *estimate* the combined student enrollment (head count) of *all* secondary schools participating in the consortium. *(n=241)*	7,800.75
Two-year postsecondary schools (e.g., community and junior colleges, two-year vocational-technical institutes and proprietary schools) *(n=349)*	1.78
If readily available, *estimate* the combined student enrollment (head count) of *all* postsecondary schools participating in the consortium. *(n=212)*	7,104.53
Four-year postsecondary schools (e.g., public and private four-year colleges and universities) *(n=152)*	1.64
Private-sector businesses and industrial firms (including private not-for-profit organizations) *(n=287)*	22.78
Labor organizations *(n=91)*	2.31
Public community-based organizations (including parent, teacher organizations) *(n=164)*	5.04
Student leadership organizations (secondary and postsecondary) *(n=83)*	4.36
Other *(specify)*: *(n=22)*	2.50

Q-15. For each group of *secondary and postsecondary* personnel listed below, *estimate* (1) the total number employed by organizations in your consortium; (2) the percentage of each group of personnel *actively* involved in Tech Prep planning, development and implementation activities; and (3) the percentage of each group that *has participated in Tech Prep inservice.*

Secondary Education Personnel	Total Number Employed	Percent (%) involved in Tech Prep	Percent (%) in Tech Prep Inservice
Vocational faculty	91.82 *(n=293)*	53.7 *(n=260)*	59.8 *(n=262)*
Academic faculty	504.99 *(n=286)*	29.9 *(n=207)*	42.5 *(n=214)*
Counselors	31.64 *(n=294)*	61.4 *(n=243)*	67.4 *(n=236)*
Administrators	43.54 *(n=288)*	56.4 *(n=242)*	60.5 *(n=238)*

Postsecondary Education Personnel	Total Number Employed	Percent (%) involved in Tech Prep	Percent (%) in Tech Prep Inservice
Vocational faculty	53.77 *(n=256)*	47.5 *(n=216)*	54.5 *(n=206)*
Academic faculty	92.97 *(n=254)*	31.2 *(n=158)*	44.7 *(n=160)*
Counselors	8.51 *(n=255)*	56.5 *(n=202)*	63.2 *(n=185)*
Administrators	18.38 *(n=266)*	53.7 *(n=230)*	59.2 *(n=206)*

Note: Due to the high incidence of non-response to this question, readers are urged to use caution in interpreting and reporting these statistics.

Q-16. Describe the most successful Tech Prep inservice activity your consortium has conducted thus far for secondary and postsecondary *and* vocational and academic education personnel. *(If additional space is needed, please use the back of this survey.)*

Refer to the section of this report on local consortium characteristics for a discussion of these open-ended survey responses.

Q-17. *Estimate* the total number of people who live in your Tech Prep consortium service area.

288,114 *(mean)* TOTAL CONSORTIUM POPULATION

Q-18. In what type of setting(s) do people in your consortium service area reside? *(Circle all that apply.)*

39.4% Rural only
24.2% All settings
10.9% Rural and Suburban
23.9% All
9.2% Suburban only
7.6% Urban only
4.3% Rural and Urban
4.3% Urban and Suburban

Q-19. For the 1992-1993 academic year, indicate *source(s) and amount of grant funds* for Tech Prep (*NOT* counting carry-forward funds from previous funding periods or in-kind contributions of goods and services). *(Enter 0 [zero] in categories where no such funds were received during 1992-1993.)*

Source of Funds	Total of '92-'93 Funds (mean)
Tech Prep grant funds (Perkins Title IIIE Tech Prep funds awarded by states) *(n=373)* Year Perkins IIIE Tech Prep funds were *first* received: 1991 *(n=264)*; 1992 *(n=127)*	97,342.87
State or federal grant funds *other* than Perkins Title IIIE Tech Prep funds *(n=101)*	62,220.58
Local funds *(n=145)*	45,572.33
Private-sector business and industry funds *(n=432)*	9,228.17
Other *(n=198)*	29,744.44
Total *(n=383)*	130,987.27

Q-20. Considering the total 1992-1993 Tech Prep funds reported in the previous question (Q-18), *estimate* the percentage that was allocated to the following activities:

Tech Prep Activity	Percent (%) of '92-'93 Funds
Program administration *(n=383)*	21.2%
Curriculum development *(n=383)*	15.0%
Staff development *(n=383)*	21.0%
Promotions and marketing *(n=383)*	6.1%
Equipment purchases *(n=383)*	15.4%
Curriculum and instructional materials purchases *(n=383)*	14.3%
Program evaluation and student (learner) assessment *(n=383)*	2.3%
Other *(n=382)*	2.9%

PART V: TECH PREP COORDINATOR BACKGROUND

Q-21. How many months have you been employed as a Tech Prep consortium coordinator? *(n=397)*

6.0%	1-6 months
20.4%	7-12 months
18.9%	13-18 months
22.2%	19-24 months
15.6%	25-30 months
2.5%	31-36 months
14.4%	More than 3 years

Q-22. How many years have you been employed in an educational setting? *(n=397)*

18.7%	1-10 years
25.5%	11-20 years
38.8%	21-30 years
17.2%	31 or more years

Q-23. Your position as Tech Prep coordinator is funded as a . . . *(n=384)*

37.0%	Full-time position
38.0%	Part-time position
20.8%	Coordinator responsibilities not funded — Tech Prep is part of regular job
4.2%	Other

Q-24. Approximately how many hours per week do you spend on Tech Prep activities? *(n=386)*

27.89 *(mean)* HOURS PER WEEK

Q-25. In what type of organization is your immediate supervisor employed? *(Circle all that apply.) (n=397)*

52.9%	Two-year postsecondary college
32.7%	Secondary school
17.6%	Other
2.8%	Four-year postsecondary college
1.3%	Business and industry

Q-26. Which category best describes your previous professional work experience? *(Circle all that apply.) (n=397)*

53.1% Educational administration
47.4% Vocational teaching
33.5% Academic teaching
28.5% Business/industry employment
16.1% University teaching/research
14.6% Guidance/counseling
13.4% Other

Q-27. What is the highest educational degree you have obtained? *(n=389)*

0.8% Associate's Degree
11.6% Bachelor's Degree
64.8% Master's Degree
20.6% Doctoral Degree
2.3% Other

Q-28. A goal of this survey is to provide ideas to improve state and federal policies regarding Tech Prep. To address this goal, we invite you to provide one or more recommendations for improving state and federal Tech Prep policy.

Refer to the section of this report on local coordinator recommendations for state and federal policy for a discussion of these open-ended survey responses.

Q-29. Please provide the following information so that, if necessary, we may follow up with you about information reported in this survey.

Name: _____

Work Address: _____

_____

_____

Phone Number: _____

FAX Number: _____